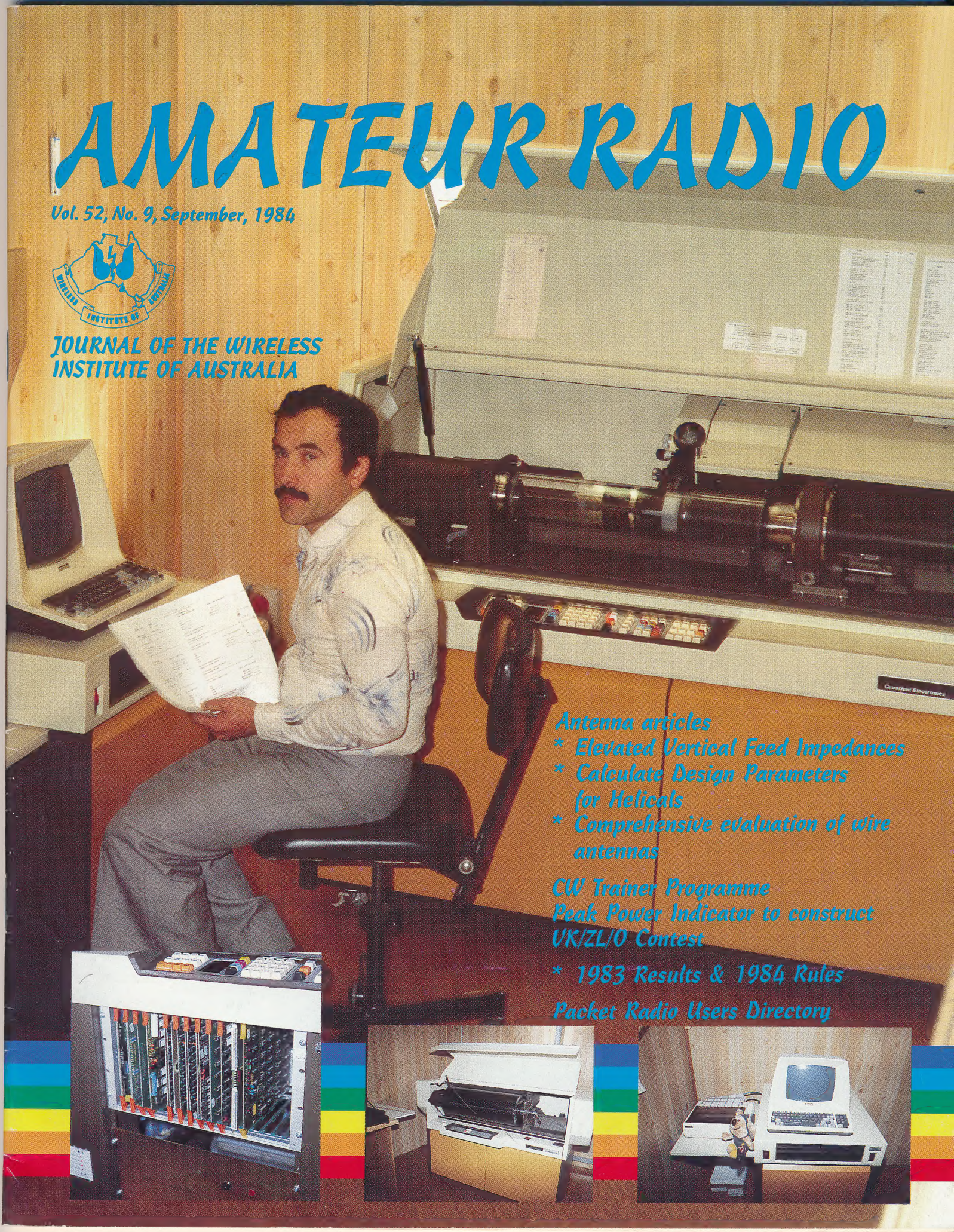
AMATEUR RADIO

Vol. 52, No. 9, September, 1984

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA



Antenna articles
* Elevated Vertical Feed Impedances
* Calculate Design Parameters for Helicals
* Comprehensive evaluation of wire antennas

CW Trainer Programme
Peak Power Indicator to construct
VK/ZL/O Contest
* 1983 Results & 1984 Rules

Packet Radio Users Directory

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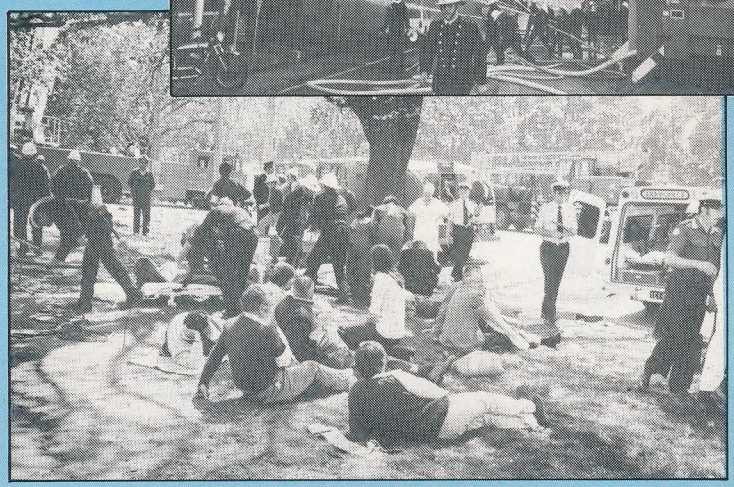

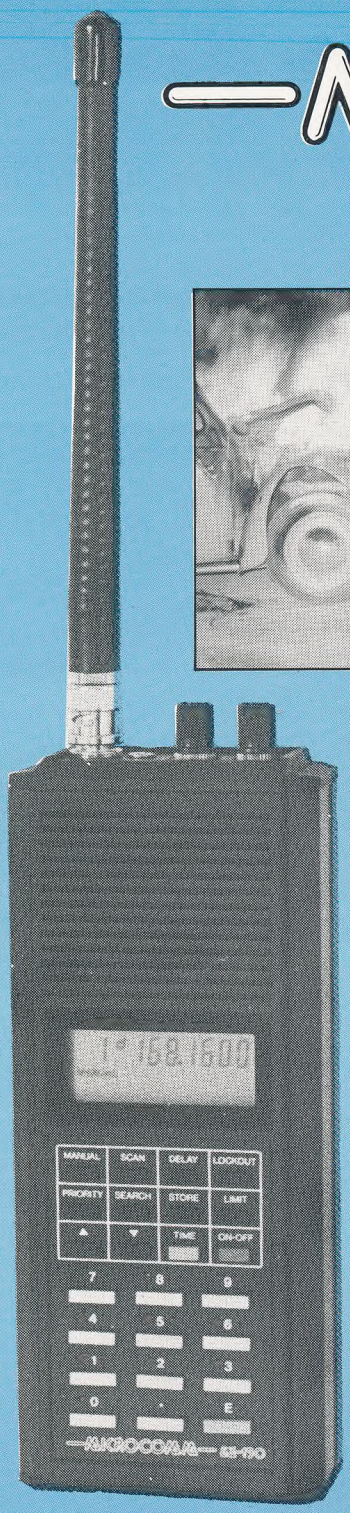

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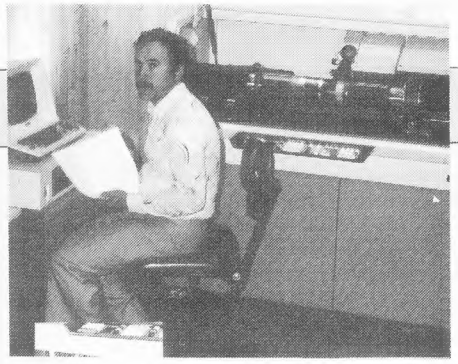

Main Photograph: Scanner Operator Dikran Chabdjian preparing to analyse a group of transparencies at the VDU Terminal. Bottom — Left: Some of the Circuit Boards in the Main Console. Centre: A view of the Exposure Unit. Right: A close-up view of the VDU Terminal. See story page 20.

AMATEUR RADIO

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DEADLINE

All copy for November AR must arrive at PO Box 300, Caulfield South, Vic. 3162 at the latest by midday 25th September, 1984.

Have you noticed the improvement in the cover photographs in the last couple of issues. The company who do the colour separations for AR recently purchased new equipment. This sophisticated electronic equipment is capable of putting more definition into the photographs. Turn to page 20 for a brief outline of how our covers are put together.

We have much pleasure in announcing the first winner for our photographic competition, this month (see page 20). There was a very high standard of photographs published during the twelve months of the contest which made the decision of the judges very difficult.

A new photo competition began with the July magazine and your photographs and articles are really appreciated. Black and white photos reproduce well, good sharp transparencies and colour pictures are also acceptable for the body of the magazine. Colour transparencies or photos in the vertical format are needed for the front cover.

Well known YL operator Austine Henry VK3YL, recently celebrated 54 years in amateur radio. Austine was Guest of Honour at a special surprise party given by ALARA. See page 36.

On the technical side it is a bonanza for those interested in aerials. There is part 2 of the excellent Field Impedance study, a comprehensive look at many types of Wire Antennas, and a computer programme to calculate Helicals. Or you may care to construct a Peak Power Indicator or compute with a CW Trainer. BKP

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Material should be sent direct to **PO Box 300, Caulfield South Vic., 3162,** by the **25th of the second month preceding publication. Note: Some months are a few days earlier due to the way the days fall. Phone: (03) 528 5962.** Hamads should be sent direct to the same address.
Acknowledgement may not be made unless specially requested. All important items should be sent by certified mail. The editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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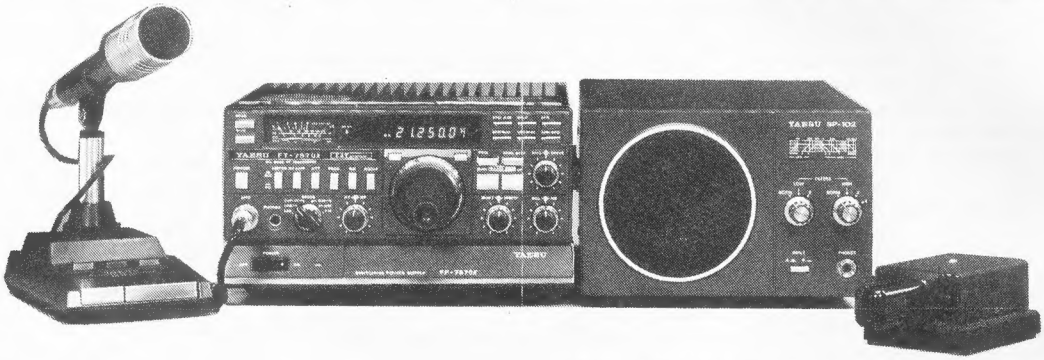

HF Transceivers

FT980 – all mode; 12 memories; general coverage Rx.
FT757GX – all mode; 8 mems; all normal options installed; gen coverage Rx.
FT102 – three 6146B's PA; optional AM/FM unit.
FT77 – 100W mobile.

VHF/UHF Transceivers

FT726R – all mode; 10 memories; 10W output; two VFO; can hold three modules (2m, 6m, 70cm, 21/28m modules) plus satellite IF unit; AC/DC operation.
FT480R – all mode 2m; 10W.
FT208R – handheld 2m; 2.5W; keypad entry.
FT203R – handheld 2m; 2.5W; thumbwheel; optional headset/mic and VOX operation.
FT290R – all mode portable 2m; 2.5W.
FT230R – mobile 2m FM; 25W; 10 memories
FT690R – all mode portable 6m.
FT790R – all mode portable 70cm; 1W.
FT708R – handheld 70cm; 1W; keypad entry.
FT730R – mobile 70cm; 10W; 10 memories.

Linear Amplifiers

FL2100Z – 160m-10m; 1200W max input.
FL2050 – SSB/FM 2m; 70W out for 12W in; 12dB receiver amp.
FL2010 – 2m; 10W out; suits FT208, FT290, etc.
FL6010 – 6m; 10W out; suits FT690.
FL7010 – 70cm; 10W out; suits FT708, FT790, etc.
FL110 – suits FT7, etc.

Antenna Tuning Units

FC700 – suits FT707/77; inbuilt 150W dummy load.
FC757AT – automatic; suits FT757/FT980; inbuilt 150W dummy load.
FC102 – handles up to 1.2 kW.
FAS-1-4R antenna selector (4-way).

External VFO

FV700DM – suits FT77/707; 12 memories.
FV107 – suits FT107M.
FV102DM – for FT102.

Transverters

FTV901R – suits FT901/902, FT101Z.
FTV707 – suits FT707/77 (takes one module).
– 6m, 2m, 70cm modules for above.

Power Supplies

FP700 – suits FT77, FT757.
FP575GX – switch mode.
FP757HD – heavy duty.
FP7 – 3 amp.
FP107 – internal power unit for FT107M.
FNB-2 – NiCad pack for handhelds.

Chargers and DC/DC adapters

NC-8; NC-3A; PA-2; PA-3; etc.

External Speakers

SP107 – suits FT107.
SP102 – suits FT102, FT726, FT757GX; has filters.
SP980 – suits FT980; has filters.
SP55 – general purpose.

Also we have range of Commercial *handhelds and mobiles aproved by DOC. Low and high band VHF, VHF Marine handheld, UHF handhelds and mobiles.*

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Transceiver Accessories

AM/FM units; keyer units; WARC band mod kits for FT101Z, FT107, FT901; FIF-232C (RS232 interface); extender boards; mobile brackets, etc.

Microphones

MD-1B8 – desk type with scanning.
MH-1B8 – hand mic. with scanning.
YM38 – desk mic. with scanning; dual impedance.
YE-7A – hand mic.; 4-pin; 600 ohm.
YD846 – hand mic.; 50 kohm.
YM36 – hand mic.; noise cancelling.
YM40 – for FT480, 680, 780.
YM47 – for FT290, 690, 790, 230, 730.
YM49 – speaker/mic. for FT290, 690, 790.
YM24A – speaker mic for handhelds.
– 4-pin, 6-pin, 7 & 8-pin plus and sockets for above.
– 8 conductor curly mic. cords.
YH-1 – headset/boom mic. for handhelds and mobiles.
– SB-1, SB-2, SB-3 switches.

Semiconductors

We have large range of spares for Yaesu equipment.

Emotator Rotators

103SAX, 502SAX, 1102MXX, 1102MSAX, 1103MXX, 1103MSAX. Rotator accessories – 301 bearing, bottom clamps, couplings, 6 and 7-core control cable.

Morse Keys

hand keys, 'Bug' key, manipulator, Katsumi electronic keyer.

Coaxial Cable

5D-FB, 8D-FB, RG58U

Headphones

YH55 – with earmuffs.
YH-77 – lightweight.

Receiver

FRG7700 communications receiver, all mode.
FRV7700 VHF converters; FRT7700 antenna tuner; FRA7700 active antenna; memory unit.

Ham Clock

Yaesu QTR24D – quartz, shows time zones.

Filters

CW, CW (narrow), AM, SSB (narrow) for HF and FT726R transceivers.
Filter FF501DX (30 MHz LP).

Service Manuals

for most transceivers and FRG7700.

Vacuum Tubes

572B, 6JS6C, 6146B, 6KD6, 6JM6, 6GK6, 12BY7-A.

Oscarblock

power/SWR dual meter – up to 150MHz.

SWR Meters

T435N fwd/ref power dual meter – 146 and 435MHz; 'N' connectors.

Antennas

Hidaka VS33 triband; VS73SR UHF 7.8dB mobile; VS73GH 70cm gnd plane; VS27GR 144/435MHz mobile; LB607 6m log beam. Yaesu RSL series for HF mobile; RSL145 2m 5/8W mobile; RSL145 2m gnd plane; RSL 435 70cm colinear; spare antennas for FT290/690; YHA-44D halfwave antenna for 70cm handhelds.

NEW 2m FM HANDHELDS from YAESU

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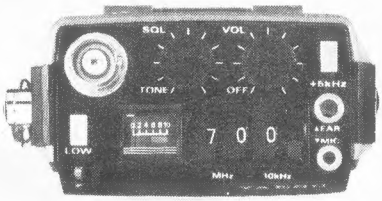

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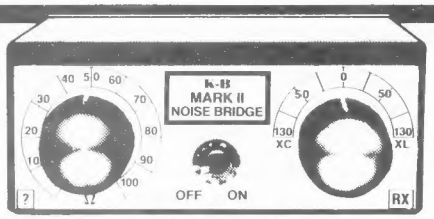

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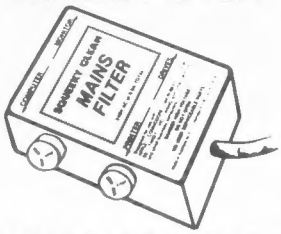

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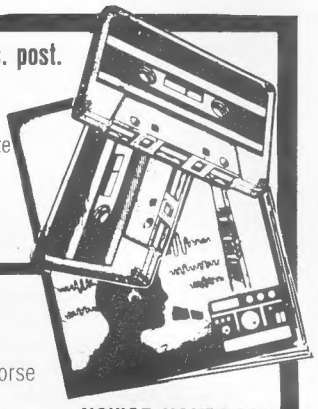

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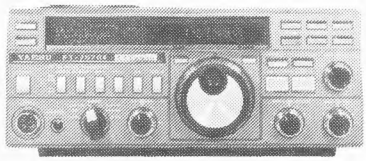

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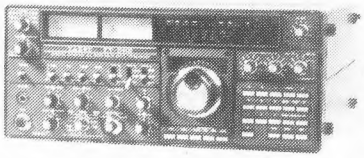
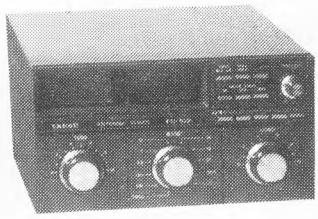


Could rise to over $3000!!

FC 102 $369



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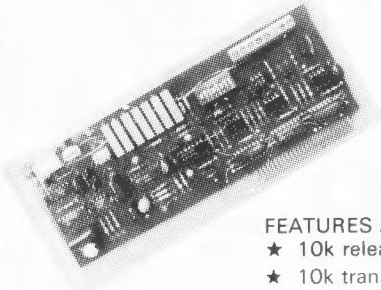
2M ALL-MODE TRANSCEIVER

TR-9500 70CM ALL-MODE TRANSCEIVER



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- ★ Split screen
- ★ Save buffers to disk
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a word from your EDITOR

QUESTIONS

A question which occurs to editors and others facing a blank sheet of paper and seeking inspiration is "*How did I get into this situation?*" A little thought leads naturally much further back in our lives to a series of questions which we amateurs have all asked ourselves.

The first question was:

"*What is a radio amateur?*

A little later on most of us asked:

"*How can* I *become a radio amateur?*"

Which of course raised another:

"WHY *do I want to become a radio amateur?*"

Most of us must have found satisfactory answers to these questions, so now we may well ask:

"*Why am I* STILL a radio amateur?"

I will not attempt, in the little space I have, to answer these questions. We have all faced up to them from time to time, and we are what we are because we found someone to answer them. Almost certainly that someone was already a radio amateur!

If we really get back to basics, the answers to all these questions involve the fact that on this planet, only human beings have the capability of speech (although whales and dolphins may almost qualify) and speech, like so many of our talents, must be used or we will lose it! Who better to use it with than those, like us, whose aim is to remove the restrictions imposed by distance?

The general public may now communicate around the world, courtesy of Telecom, OTC and their overseas counterparts. This is directly because people like us, in past generations, sought to extend their verbal horizons beyond the limits of sound alone. The whales did well, with *DX* across half an ocean (until we introduced the QRM of ships) but only *homo sapiens* could devise and build such things as wires and keys, *sounders* and speakers, relays and microphones, valves, transistors, rockets, satellites and interplanetary probes. And we've barely started!

Returning to earth, there is one more question:

"*Why should I join the Wireless Institute?*"

Most of you will already have found the answer to that one, too. "Unity is strength" is only one of many good reasons. Do you know an amateur who is not a member? See if you can persuade him or her to join us. If all, rather than half Australia's amateurs belonged to the WIA, we could advance all our interests at least twice as well.

Bill Rice VK3ABP
Editor
AR

WIA NEWS

NEWS FROM THE DEPARTMENT OF COMMUNICATIONS

Press Release No 84/36 of June 1984 gives the news that Television Service Areas are to be defined.

The Minister for Communications, Mr Michael Duffy, said he agreed with a Tribunal opinion, expressed in the 1983 Foster report, that stations in defined service areas should not enjoy mutually exclusive rights, and that in appropriate circumstances overlap areas needed to be recognised.

But in recognising an overlap area it was essential to ensure that such an area did not allow any one commercial station to make inroads into the market of another. This was particularly important in looking at the service areas of capital city stations and nearby regionals.

He said he wanted to emphasise however that he would generally be reluctant to approve translators in overlap areas. In exceptional cases like Gosford-Wyong it would be essential that translators were deliberately designed to ensure they did not extend reception beyond the specified service area of the related parent station.

Mr Duffy said the service area determinations for the Sydney and Newcastle stations were among the first to be specified under current requirements of the Broadcasting and Television Act.

Precise descriptions of the service areas were available from the Department of Communications, but that of the three Sydney commercial television stations could briefly be described as the Sydney Statistical Division as defined by the Australian Bureau of Statistics at the 1981 Population Census.

In general terms the service area of the Newcastle commercial television station included the City of Newcastle and the area surrounding it, approximately to Gosford-Wyong in the south, The Broadwater and Dungog in the north and Murrurundi and Merriwa in the west.

The Minister said that eventually service areas would be determined for all commercial radio and television stations in Australia. Such action was essential if the planning and development of broadcasting services was to proceed on a rational basis.

Radio and television station licensees were obliged to provide an adequate and comprehensive service to all communities within their service areas, Mr Duffy said.

By the same token, within a defined service area, the relevant station's signal was entitled to protection from interference caused by any other station, provided the signal was of an adequate level.

"*The development of service area specifications is thus of considerable importance to stations and their immediate neighbours, and to the communities living within the defined boundaries,*" Mr Duffy said.

AR

THE FEED IMPEDANCE OF AN ELEVATED VERTICAL ANTENNA

Guy Fletcher, VK2BBF
3/34 Benelong Road, Cremorne, NSW 2090

Part 2: An exact expression, for any height above ground

The first part of this article gave semiquantitative arguments why the feed impedance of an elevated ¼-wave ground plane antenna with horizontal radials is expected to be around 19 ohms. In this second part I describe one way in which antenna impedance can be calculated, and apply it to a monopole of arbitrary length H at a general height D above ground. Most of the mathematical details are relegated to an appendix, but the result is given in full for the record, and illustrated by graphs for two important special cases — the ¼-wave and ⅝-wave antennas. Part 3 will include a brief discussion of the implications of the results for mobile antennas, some advice on how to evaluate numerically the result given here, and some comments on antenna gain.

POWER RADIATED BY AN ELEVATED MONOPOLE

The easiest way to calculate antenna impedance is to find the total radiated power when a current I flows in the antenna. The geometry of the antenna is shown in Fig 4. The ground plane is assumed not to radiate and is located at height D above a perfectly conducting ground. The antenna length is H. For the real antenna (z>O) the antenna current varies with height z and time t as

$$I = I_m \sin k(H+D-z).\ \exp(-i\omega t)$$

falling to zero when z=H+D. k is called the wave number, and is equal to $2\pi/\lambda$. I_m is the maximum value of the peak current, occurring at a quarter-wavelength below the tip.

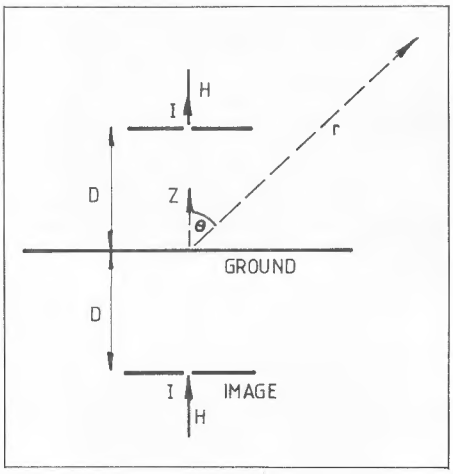

Fig 4. Elevated monopole antenna of length H at height D above ground.

For the image antenna (z<O) the current is

$$I = I_m \sin k(H+D+z).\ \exp(-i\omega t).$$

Notice that both currents are "up" in the same direction, reinforcing when D is small.

Reference books on radiation theory, eg Jordan (3), give expressions for the electric field at a distance r due to a current element ($I\delta z$) of an antenna; one convenient form of this is

$$\delta E = \frac{n(I\delta z)\sin\theta}{2\lambda r}.\ \exp(ikr)$$

where n is a constant equal to $\mu_o c$, or approximately 120π ohms. The electric field at distance r and direction θ may now be written down as the sum of two integrals, one for the actual antenna and one for its image, and evaluated. The resulting expression is a little frightening at first sight, and is therefore relegated to the appendix; let's simply call the peak field E.

The next step is to imagine a very large sphere of radius r centred on the antenna, and to calculate the power flowing out across unit area of this sphere in the direction given by θ.

This is known as the Poynting vector:

Power per unit area = $E^2/2n$.

This power per unit area of course varies with direction θ, so to find the total power P radiated across the whole sphere a second integration over θ is necessary. This gives an expression for P in terms of I_m.

THE RADIATION RESISTANCE

The final step is to relate the radiated power P to the radiation resistance R_l, remembering that I_m is a peak current with respect to time, and not an RMS current. Thus if the antenna behaves as a resistance R_l,

$$P = 0.5\, I_m^2 R_l$$

$$\text{or } R_l = 2\,P/I_m^2.$$

This is the desired expression for the radiation resistance — almost. R_l is called the radiation resistance relative to the loop current I_m. The peak current at the base of the antenna is only equal to I_m for antenna lengths H = 0.25λ, 0.75λ, 1.25λ etc. In general the feed current at the base is

$$I_b = I_m \sin kH,$$

$$\text{and } I_b^2 R_b = I_m^2 R_l,$$

so the antenna impedance relative to the base current is

$$R_b = \frac{R_l}{\sin^2 kH}$$

For antenna lengths H equal to a multiple of 0.5λ, R_b goes infinite (in theory) due to this last relation, but R_l does not become infinite, which is why it is a useful parameter. Actually R_b is not quite infinite either; the assumed model of a sinusoidal current distribution along the antenna is not precisely true, and the difference matters in the case of a half-wave monopole. R_b is certainly large, but not infinite.

Now for the final result of the calculation:

$$R_b.\ \frac{4\pi\sin^2(2\pi H)}{n} = S_l(4\pi H) + \sin^2(2\pi H)\left[\frac{\sin 4\pi D}{4\pi D} - 1\right]$$
$$+ 0.5\sin 4\pi(D+H)\,[Si(8\pi D) - 2\,Si(8\pi D+4\pi H) + Si(8\pi D+8\pi H)]$$
$$- 0.5\cos 4\pi(D+H)\,[S_l(8\pi D) - 2\,S_l(8\pi D+4\pi H) + S_l(8\pi D+8\pi H)].$$

In this expression H and D have been redefined in units of one wavelength for convenience. Thus for a ¼-wave monopole at height λ/8, put H=¼ and D=⅛. The constant $n/(4\pi)$ is equal to 29.98 ohms.

The functions $S_l(b)$ and Si(b) are special functions which cannot be integrated analytically. Tables of their values exist, though never quite the ones you want. They are most easily evaluated numerically on any small computer:

$$S_l(b) = \int_o^b \frac{(1-\cos x)}{x}\,dx,\quad Si(b) = \int_o^b \frac{\sin x}{x}\,dx.$$

THE ¼-WAVE AND ⅝-WAVE ANTENNAS

The horrendous expression above for an antenna of any length simplifies considerably for a ¼-wave antenna, particularly for D=0 or infinity. Setting H=¼ and D=0 gives

$$R_b = 29.98 \times 0.5\, S_l(2\pi) = 36.5 \text{ ohms}$$

as expected. If H=¼ and D∞, the terms in square brackets involving the Si and S_l functions go to zero, leaving

$$R_b = 29.98\,[S_l(\pi)-1] = 19.4 \text{ ohms.}$$

This is reassuringly close to "rather greater than 18.25 ohms" as predicted in part 1.

For the ⅝-wave antenna the expressions are less simple, but lead to a feed impedance at the base of 106.5 ohms for zero height, and 120.8 ohms for infinite height. Notice that because of the interference effects between different parts of the antenna and its image even at zero height, the effect of elevating the antenna is actually to increase its base feed impedance, though only by 13 percent.

How high must an antenna be for its impedance to change to the "elevated" value? Surprisingly low. We might speculate that interference effects would certainly be significant at an elevation of 0.5λ. To find out, the feed impedance at the base must be evaluated for each antenna over a range of different heights. I show graphs of these in Fig 5. It is clear that by an elevation of one half-wavelength the impedance is well on the way to settling down to its value at infinite elevation. To the best of the author's knowledge these graphs have never appeared previously, in amateur radio literature at least. I hope they will now become widely known.

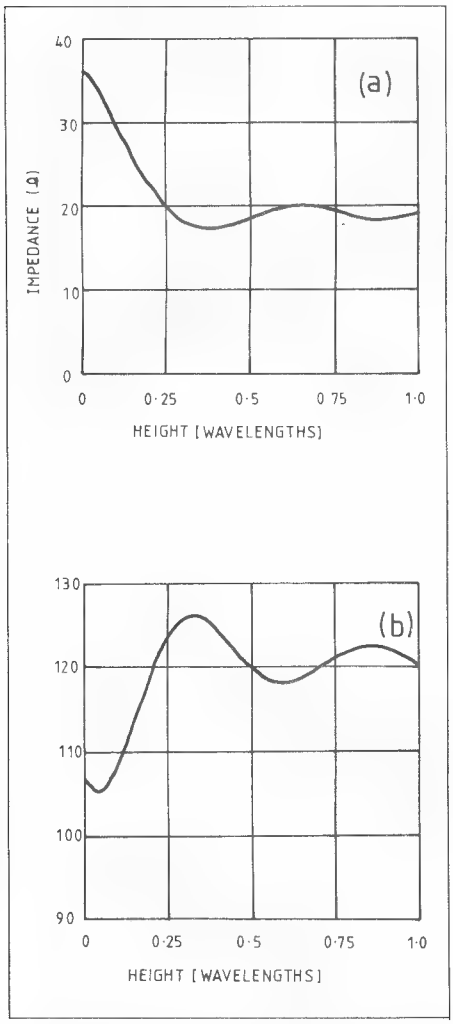

Fig 5. Base feed impedance of (a) ¼-wave, and (b) ⅝-wave vertical monopole antennas as functions of height D above ground.

The impedance calculations in this article are based on a "thin" radiating element. The effect of thickness is quite small for short elements such as the ¼-wave monopole but becomes significant for the longer ⅝-wave antenna (3). So don't put too much faith in the exact impedance figures for the ⅝-wave antenna; however the impedance will still show the same variation with height above ground as depicted in Fig 5.

REFERENCES TO PART 2

(3) "Electromagnetic Waves and Radiating Systems" by E C Jordan, Prentice-Hall Inc

APPENDIX TO PART 2

This appendix is intended to fill in some of the mathematical gaps to enable a mathematician or antenna engineer to follow through the calculations. It is definitely not for general reading.

The starting expression for the peak electric field is

$$E = \frac{nI_m \sin\theta}{2\lambda r}\left\{\int_D^{D+H} \sin k\,(H+D-z)\exp i(kz\cos\theta)\,dz + \int_{-(D+H)}^{-D} \sin k(H+D+z)\exp i(kz\cos\theta)\,dz\right\}.$$

Integration of this leads to the expression

$$E = \frac{nI_m}{2\pi r\sin\theta}\left\{\cos(kD\cos\theta)\,[\cos(kH\cos\theta)-\cos kH] - \sin(kD\cos\theta)\,[\sin(kH\cos\theta)-\cos\theta\,.\,\sin kH]\right\}.$$

The power per unit area is integrated over half of all space, ie that part of space above the ground, to give the total power P:

$$P = \int_0^{\pi/2} \frac{E^2}{2n}\,.\,2\pi r^2 \sin\theta\; d\theta\,.$$

It is convenient to go straight to the expression for the radiation resistance R_l relative to the loop current.

$$R = \frac{2P}{I_m^{\,2}}$$

before evaluating this integral of power. I_m and r then cancel out of the expression. This integration is quite nasty because of the squaring of the long expression for E above. There seems to be no easy way out, and some persistence is needed to reach the final expression given above in the article. Substitution of u=cos θ is helpful, and after some adjustments using the fact that the integrand is even, a further substitution of 1+u⁻x can be made. The integral can then be separated into three separate integrals according to the power of x, and hammered out.

(to be concluded)

AR

QSP

NZART NEWS

NZART have notified that the 1985 subscription will be NZ$37. This change in their subscription rate was authorised at the AGM held at Palmerston North on 2 June 1984.

18 AND 24 MHz BANDS

There is an indication that New Zealand amateurs may have use of these bands before Christmas 1984.

(Both items supplied by Neville Copeland ZL2AKV) **AR**

QSP

WIA COMPUTER

As members will be aware at the 1984 Convention, the Council agreed that an "in house" computer system be purchased by the Federal Office to manage the membership recording.

The supply of the system was put out to Tender at the end of June and closed on the 16th July, 1984. Some 25 suppliers have responded and the choice will be made within the next few weeks.

This new system will bring membership recording into a position of being as up to date as is possible. All are no doubt aware of the deficiencies of our old system, (which in its day was a big step forward), but its major problem was its inflexibility.

More details will be supplied as the system becomes operational.

RJ MACEY
SECRETARY
AR

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CW TRAINER PROGRAMME FOR COMMODORE 64 & VIC 20

Neil Cornish VK2KCN
56 Sherwin Avenue, Castle Hill NSW. 2154

This programme allows owners of these popular computers to practice CW receiving at any time. Features of the programme include:-

- visual display of the code on the screen.
- generation of CW from keyboard.
- generation of random groups of letters only, or letter/number combinations.
- generation of random groups as above, with each character sent twice.
- generation of random groups using only user-defined problem letters or numbers.
- generation of plain text from computer memory, including an actual AOCP exam.
- generation of plain text from keyboard. EG have a friend type some plain text on the keyboard for the student to read.
- speed fully variable from 1 to 25 WPM.
- spacing between characters fully variable whilst actual characters are sent at correct speed.

The Morse quality is good and possibly better than some of the recorded exams I have sat for.

If, unlike the author, you would prefer to spend the time taken pecking in and de-bugging the programme, actually using it to get set for the next exam, then send $5 for tape or $10 for disk. Specify VIC or C64.

Thanks should also go to John VK2DDA for some of the original ideas.

```
1 REM[illegible]
2 PRINT"[illegible]"
3 W$="ABCDEFGHIJKLMNOPQRSTUVWXYZ":W1$=W$+"0123456789"
4 S=40:SD=54272 FORDS=3TOSD+24.POKEDS,0 NEXTDS
5 DIMM$(90):FORI=40TO90 READM$(I) NEXT:M$(33)="111333111":M$(36)="111313"
6 FORI=1TO8 READA$(I):NEXT FORI=1TO10.READD$(I) NEXT
7 PRINT"[illegible]":PRINTTAB(13)"[illegible]MORSE TRAINER*" PRINT"[illegible]",
8 S=25.0$="C9 CO DE VK2KCN  K" LETL=LEN(O$):FORI=1TOL  .
9 M$=MID$(O$,I,1) PRINTM$, GOSUB45 NEXT.PRINT
10 PRINTTAB(13 "[illegible] COMMODORE 64 "
11 PRINTTAB(10"*NEIL CORNISH VK2KCN*" FORI=1TO3000 NEXT
12 PRINT"[illegible]MENU,SELECT FUNCTION" PRINT FORI=1TO6'PRINT"F",A$(I) NEXT
13 PRINT:PRINT"DURING THE PROGRAM." PRINT
14 PRINT"TO RETURN TO THE MENU PRESS [F7]"
15 PRINT"[illegible]TO ALTER SPEEL ETC    PRESS [F6] "
16 G=1 GOSUB81 A=HS.(A$)-132 IFA'10RA'8THEN16
17 IFA=8THEN89
18 G=0 PRINT"[illegible]",A$(A) FORI=1TOLEN'A$(A)' PRINT"[illegible]", NEXT PRINT
19 GOSUB87
20 ONAGOTO21,38,121,151,29,97,137,5
21 REM[illegible]
22 GETB$ IFB$[illegible] THENB$=B$+B$ PRINTB$
23 IFB$=CHR$(136)THEN 12
24 IFB$=CHR$(140)THENGOSUB87
25 IFB$="THEN21
26 M$=LEFT$ B$,1) G'GOB45
27 IFLEN B$=1THENB$=" " GOTO21
28 B$=RIGHT$ B$,LEN B$ -1) GOTO21
29 REM[illegible]
30 GOSUB92
31 FORHB=1TO10 L$=J$(HB)
32 FORO=1TOLEN(D$) GET L$ IFC$=CHR$(136 THEN12
33 GETC$ IFL$=CHR$(140 THENGOSUB8
34 M$=MID$.D$,J,1, X$=M$ GOSUB45 PRINX$, NEXT PRINT FORD=1TO7*5 NEXTD NEXTAB
35 PRINT PRINT"PRESS SPACE TO CONTINUE"
36 GETAC$ IFAC$=[illegible] 'THEN36
37 GOTO12
38 REM[illegible]
39 D$=' [illegible] DT$="@" K=0
40 FORI=48TO 90 K=K+1 IFK=10THENGOSUB79
41 PRINTCHR$ I),TAB 2) FORJ=1TOLEN(M$ I )
42 IFMID$(M$(I),J 1)= 3"THENPRINTD$
43 IFMID$(M$(I),J,1,="1"THENPRINTDT$
44 PRINT" ", NEXT PRINT"@" NEXT'GOSUB'9 GOTO12
45 REM[illegible]
46 IFM$=' "THENFORD=1TO$*7 NEXT'RETURN
47 IFASC(M$) 90THENRETURN
48 M=ASC(M$) M$=M$(M)
49 FORL=1TOLEN(M$)
50 E=VAL(MID$(M$,L,1))
51 POKESD+5,9 POKESD+6,240 POKESD+24,15 POKESD+1,33 POKESD,135 POKESD+4,17
52 FORD=1TOE*S NEXT
53 POKESD+4,16
54 FORD=1TOS NEXT
55 NEXTL
56 FORD=1TOS*3 NEXT
57 RETURN
58 DATA313313,313313,13131,31313
59 DATA331133,31113,131313,31131
60 DATA33333,13333,11333,11133,11113,11111,31111,33111,33311,33331

61 DATA33111,31313,111,11,1111111,31331 113311 13111
62 DATA13,3111 313,311,1 1131,331 1111 11,1333,313 1311 33,31,333 ,331 3313
63 DATA131,11 3,113 111[illegible],33 3,13 3133,3311
64 DATA1..CW KEYBOARD,..SHOW CODE
65 DATA2..RX LETTERS ONLY 3..RX PROBLEM LETTERS
66 DATA4..RX PLAIN TEXT 4..RX RANDOM GROUPS
67 DATA5..SPECIAL TEXT RAND 6..PRINTSHED PROGRAM
68 DATA* THE SPRING  EQUIN RAS STARTED AND 1 5 6 MILLIMETRES OF SNOW HAS FALLEN
69 DATA 30 MOUNTAINS MOVE 1 4 9 7  METRES ALL MOUNTAINS ARE PROJECTED TO
70 DATA ARRY CHAINS 3  [illegible] 5 ARE  PERMITING DAILY ARRIVAL IMMEDIATY 4 .  THAS WENT
71 DATA THE HOLIDAY EARLY FRIDAY  TURNING FIGHTERS AND [illegible] MADE UP 3 ' FEE
72 DATA CENT  OF THE [illegible]
73 DATAREGATIVE PEAK AT 270 DEGREES THE  ARRIER FREQUENCY CHANGES TO [illegible]
74 DATAVALUE FINALLY WHEN THE MODULATING [illegible] 0 [illegible] DEGREES THE
75 DATA.ARRIER IS BACK TO ITS CENTRE FREQUENCY WE CAN THUS SEE THE FU[illegible]
76 DATA[illegible] WITH [illegible]
77 DATA ENTER FREQ ENCY AS MODULATION [illegible]
78 DATAINCREASE AND DECREASE IN SYMPATHY WITH THE [illegible]
79 REM[illegible]
80 PRINT"PRESS [illegible]
81 GETA$  IFA$=""THEN81
82 IFG=1THENRETURN
83 PRINT  [illegible]
84 K=K+1 IF K40THEN[illegible]
85 K=K+1 IF[illegible]
86 PRINT"[illegible]
87 REM[illegible]
88 PRINT [illegible]
89 REM[illegible]
90 S=20 PRINT"[illegible]
91 M$=MID$(O$ 1,1 [illegible]
92 REM[illegible]
93 PRINT [illegible]
94 FOR [illegible]
95 [illegible] THEN*PRINT [illegible]
96 NEXT PRINT [illegible]
97 REM[illegible]
98 [illegible]
99 REM
100 PRINT [illegible]
101 [illegible]
102 INPUT"[illegible] LETTERS ONLY  Y'N [illegible] IFY$="Y" IFY$= N' [illegible]
103 [illegible]
104 [illegible] IFY$=" "THEN[illegible]
105 PRINT
106 INPUT"[illegible]
107 GOSUB[illegible]
108 PRINT [illegible]
109 M$="+' GOSUB45 FORI=1TO7*S+BB*S NEXT TI$="000000
110 FORHH=1TO2
111 FORDD=1TO5
112 R=INT(RND(1)*W +1 M$=MID$(W$ R,1) MM$=M$ GOSUB[illegible]
113 PRINTMM$
114 NEXTDD PRINT" ", FORD=1TO7*S+BB*S NEXTD NEXTHH
115 M$="*' GOSUB45 PRINT'TIME= ,TI$
116 PRINT PRINT'SAME AGAIN=[SPACE]' PRINT'ALTER  =[F6]' PRINT'EXIT  =[F7]'
117 GETH$ IFH$=""THEN117
118 IFH$=CHR$(140)THENGOSUB187
119 IFH$=CHR$(136)THEN 12
120 GOTO105

121 REM[illegible]
122 PRINT PRINT"[illegible]PACING' 0-15[illegible]"
123 INPUTRH IFRH'0ORRH 15THEN12
124 INPUT"[illegible]LETTERS ONLY[illegible]" Y$ IFY$= Y"ORY$="N"THEN[illegible]
125 GOTO124
126 PRINT'[illegible]TER SPACE PRESS [F6]N' [illegible]
127 AR= 40*RH A$=W$ W=[illegible] IFY$="N THENA$=W1$ [illegible]
128 FORHH=1TO8
129 FORL=1TO5 GETC$ IFC$ [illegible] THEN[illegible]
130 IFC$=CHR$(140)THENGOSUB[illegible]
131 R=INT(RND(1)*LEN(A$)+1 M$=MID$(A$ R,1) MM$=M$ GOSUB45 FORD=1TORH NEXTD
132 PRINTMM$  [illegible]M$ GOSUB45 FORD=1TORH [illegible]
133 NEXTD PRINT" " [illegible]
134 PRINT'[illegible]PRESS  SPACE  TO CONTINUE"
135 GETH$ IFH$= "THEN[illegible]
136 PRINT'[illegible]
137 REM[illegible]
138 INPUT"[illegible] 1  0 50 [illegible]
139 PRINT  [illegible]
140 PRINT"[illegible] TYPE IN TEXT [illegible]"
141 GETT$ IFT$=" " [illegible]
142 IFT$=CHR$ [illegible]
143 IFT$=CHR$(140)THEN[illegible]
144 IFT$= [illegible]
145 PRINT [illegible]
146 GOSUB45 M$= [illegible]
147 FORI=1TOLEN T$
148 M$=MID$(T$,I 1  [illegible]
149 PRINTMID$(T$,[illegible]
150 FORI=1TO5*[illegible]
151 REM[illegible]
152 S=25.0
153 PRINT PRINT"[illegible]PACING  ENTER 1-1[illegible]"
154 INPUTRH IFRH'0ORRH[illegible]
155 AR=40*RH PRINT
156 INPUT"[illegible] MANY WORDS[illegible]"
157 IFH$ CHR$ 140 THEN160
158 INPUT"[illegible]AME LETTERS [illegible]
159 IFJ$="Y"THEN161
160 INPUT"[illegible]PROBLEM LETTERS[illegible]"
161 LETPP=LEN(PP$)
```

```
[illegible]
[illegible]
[illegible]
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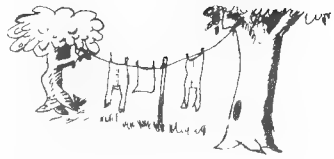

WIRE ANTENNAS

Rob Gurr, VK5RG
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A large number of recent entrants into the hobby of amateur radio, have been indoctrinated with the belief that unless an antenna is made of aluminium tubing, has coaxial cable feedlines, and a popular brand name or type number, it is not worth considering. Regrettably also they may come to believe the only useful "Wire Antennas" are the Rhombic, Vee Beam and long wires, which could not possibly be considered for the average suburban backyard.

Most of the popular commercial aerials have some limiting factor for today's amateur — they cover only one or at the most three, narrow frequency bands, (ie have low SWR over small segments of the spectrum), require good ground plane radial systems, are difficult to tune to alternative frequencies, and, in some cases, are costly.

The wire antennas I propose to discuss are those which, when erected in a suburban backyard, will give equal or better facilities than an equivalent commercial installation.

Firstly a few words about the components and hardware.

The Wire

A 100 metre reel of 2.5 mm² stranded copper earthwire with PVC insulation costs about $20 from electrical trade outlets — don't buy it by the metre at retail hardware shops, or you may pay up to three times this price. One hundred metres may last a long while, however a friend may share the cost with you. In most cases, by the time an antenna and feedline is constructed, there will be little surplus.

Connectors

Soldering wire joints outdoors is not always practical — the use of commercial brass earth connectors, such as Clipsal Type 563/2, or similar, is recommended. These may be covered over with insulation tape, or alternatively with silicone rubber, if additional weatherproofing is required.

The soldered joint is of course to be preferred, however it should be a mechanically suitable joint, with wires twisted a number of times, before solder is applied.

The writer has had experience with the "Post Office" or "lineman's" joint, and finds this quite suitable for copper wire aerial connections.

Masts

Steel tubes, sectionalised masts, wooden poles are all suitable. The use of trees, house fascias, and other elevated supports is also possible, providing suitable anchoring techniques are used. "U" bolts, turnbuckles, etc are a standard hardware shop line.

The use of trees is also satisfactory, however due to wind sway the use of halyards and pulleys utilising springs and counterweights is recommended.

Guy Wires

Stranded steel galvanised wire may be used — joints can be made using clamps, turnbuckles and thimbles, as well as the above mentioned Post Office splice method. It is good practice to use insulators liberally, at about every 3 metres, however if a one length guy wire is preferred, an insulator at the top and bottom is essential. This requirement is to ensure that the length of wire associated with any unbonded metal to metal contact (thimble through the eye of a turnbuckle) is as short as possible. This prevents large signal pickup and subsequent re-radiation, should corrosion at the junction occur. We are all familiar with unexplained "crackles" on our receivers, and also with cross modulation involving broadcast stations, which mysteriously worsens on dry windy days!

Should it be necessary to have a long length of guy wire, or a cable catenary system that cannot be broken up with insulators, all metal/metal flexible contacts should be bonded over, or liberally coated with a graphite (conducting) grease — EMF Welder Grease, by Golden Fleece has been my favourite, but other brands are available.

It is not necessary to break guy wires into short sections using insulators — if you are inclined to do so, break them at quarter wavelengths on the highest frequency in use — ie every 2.5 metres for 28 MHz.

Transmission Lines and Spreaders

The construction of a suitable open wire line can be simplified by the use of 16 mm, or 20 mm, heavy duty electrical conduit. Some doubts may be held by some readers about the suitability of plastic as an insulator for feedlines in this manner — I don't think a contact has ever been lost due to any supposed losses. The use of UPVC to ensure minimum deterioration due to ultraviolet radiation is not considered necessary. Holes in the conduit to allow the wire to pass through, and a smaller diameter tie wire to prevent the spacer slipping down the feedline are required. Spacing of 50 to 150 mm is suitable. Feedlines should be drawn away from antenna arrays at right angles.

Spreaders for separating the elements can also be made from electrical conduit, with a wooden dowel inserted internally to give rigidity. The conduit lengths available are regrettably a maximum of 4 metres; some ingenuity may be required to obtain simple spreaders over this length. Aluminium tube 25 mm diameter is suitable for up to 5 or 6 metres, and as it is usually at right angles to the antenna wires should have little effect on radiation. Short aluminium tube lengths may be used for joining wooden dowels, prior to enclosure in PVC conduit. Conduit caps (Clipsal 252 series) are recommended.

Coupling Units

Most of the antennas to be described are balanced and symmetrical — the feedlines are not always "flat" (SWR terminology) and the impedances presented at the amateur equipment may vary from less than 20 to over 1000 ohms. Most multipurpose ATUs ("Z" Match, "T" match with Balun) will be capable, with the assistance of a suitable SWR meter, of converting these impedances to 50 ohms to interface with standard amateur equipments. The description of a suitable ATU is included at the end of this article.

Earthing System

It is desirable with all aerial installations to have a good RF earth, and essential when using end fed wire antennas (verticals or horizontal) to have a very efficient earth. There are many theoretical approaches to this; however if one very good earth point can be established immediately adjacent to the ATU, and all other equipment bonded back to this wire, it should be sufficient for most applications. The earth lead should be as short as possible, as the ATU is part of the antenna system — all bonding earths to equipment are ancillary to this main lead. (It should be remembered that the amateur equipment itself should be discretely earthed through the three wire power cable, General Purpose Outlet, and the Supply Authority System, all complying to the requirements of the SAA Wiring Rules AS3000.)

A suitable earth stake may be a 2 m length of 20 mm water pipe driven into the ground with a standard electrical earth clamp for connection to the wire. In the case of end fed wires, or ground planes, all nearby exposed metal such as carport supports, roof decking, galvanised fences, domestic water pipes, should be bonded back to the *earth stake*.

A suitable wire is 6 mm² electrical insulated

(Green/Yellow) earth wire from the electrical trade outlet.

Remember, the longer the earth lead, the higher the ATU is above radio frequency ground — the reason you get "bites" from microphone cases and equipment, is these items are usually a quarterwave (on 28 MHz) above ground, where a high RF voltage exists. These aspects are more important in the end fed situation.

In a practical situation, most amateurs should be able to achieve an earth wire of no more than a metre in length — do not place your ATU at the top of everything else, as you may very easily achieve that undesirable quarterwave! This is why ATUs at broadcast stations are at the base of the tower.

Feedlines (further comment)

Textbooks and practical experience vary — a line constructed for 300 to 800 ohms would be suitable in most cases — the 300 ohm open wire TV ladder line is satisfactory, however do not use any other type of 300 ohm commercial feed line.

A home made line of spacing between 50 mm and 150 mm is recommended — spacers installed every 300 mm for narrow spaced lines and every 1 metre for wide spaced lines.

Lines could be pulled tight, however a loose hanging line with no right angle bends is acceptable — wind sway is no problem unless the lines are running close to earthed metal surfaces such as roofs etc. I would inject a word of warning here, do not treat a tiled roof as an unearthed surface — usually below the tiles you find hot and cold water copper pipes, electrical wiring, TV antennas and associated cables, telephone wires etc, all of which have an influence on any nearby aerials or feedlines.

The entry of the feedline (2 x 2.5 mm^2 insulated copper stranded wire) to the radio room is best via feed-through insulators — there are many variants available, most of which suggest themselves. Do not run through a metal frame window and close the window on the line — the window may be at a quarter wave point and the high voltage will burn the insulation through, and so on. Brickwork entry is possible using small diameter conduit in mortar courses etc. Also maintain the same spacing between the conductors for the full length of the line to the ATU.

A good test of a feedline is to listen on it, through the ATU, when the aerial is disconnected — if you hear nothing then it is balanced. It is good practice to have an integral number of quarter waves in a feedline, however random lengths do not inhibit good results — they only make the ATU work into reactive loads.

Types of Antennas

The following electrical types will be discussed:

1. Dipoles
2. Collinear arrays
3. Broadside arrays
4. End fire arrays

These are known under such titles as: G5RV, ZL Special, G8PO, W8JK, Lazy H, Sterba Curtain, End Fed Zepp, Double Zepp, Extended Double Zepp, Phased arrays, Franklin antenna, 4 halfwaves in phase etc.

Antenna Gain

Three basic points only can be made:

1. No two halfwave dipoles fed from the same transmitter, can ever produce more than 3 dB gain over one dipole — this occurs when the bidirectional radiation from both is concentrated in one direction only, ie 3 dBd. This occurs whether parasitic or driven arrays are considered.

2. The above gain is real — it is made to look bigger if described as gain over "isotropic", which adds 2.2 dB to the figure. Hence two halfwave elements can give no more than 5.2 dBi gain.

3. Stacking (vertical or horizontal) of equal combinations of elements at a maximum produces a further 3 dB gain. Hence 4 halfwave elements (2 pairs of two) can at maximum, without interaction considerations, be able to give only 8 dBi.

I shall not make any substantial gain claims on any of the antennas under consideration, leaving the reader to ponder the relative values for himself. In practical terms, gain looks better on a receiver "S" meter than it really is — side lobe attenuation reduces on-frequency interference, and the incoming signal "stands out" much more, and in addition, the angle of arrival of the signal is reduced, thus giving reduced "hops" in a long DX path with less propagation loss.

Front to back varies — bidirectional arrays have none, however some arrays can actually be adjusted for virtually no signal from the back — in such situations 40-50 dB has been achieved in practice.

Elements

The basic antenna from an amateur point of view is the halfwave dipole. We all understand it and have our own opinions of it as the practical answer to our needs. Physicists and engineers will often speak of "doublets", as their basic element, but the step between a doublet and a dipole is of no real concern to an amateur radio enthusiast.

It should be recognised that the halfwave dipole is not the only dipole used in antenna elements. A dipole 1½ waves long, centre fed on 14 MHz is known in the amateur vernacular as a G5RV type — we wouldn't easily understand what was being used if we got too technical and described every antenna by its electrical dimensions.

Similarly a dipole can be less than a halfwave — the same G5RV becomes a dipole, that is shorter than a halfwave, when used on 3.5 MHz. We still call it a dipole though!

It should be remembered that a halfwave dipole is still a halfwave dipole, whether it is end fed, centre fed, or off-centre fed. The earlier amateur discoveries that open wire, coax with balun, or Zepp feeders gave different results were due to the individual care taken in matching, and not due to any possible change in radiating properties.

A halfwave dipole is bidirectional with two lobes only; however, at a specific length well beyond a halfwave, the radiation breaks up into more lobes, that in effect make it a multi-directional radiator. In the case where the overall dipole is 1.28 wavelengths long the two lobes have a maximum gain over the halfwave dipole of 3 dB, making such a dimension very interesting to an amateur.

Of course most VHF antenna enthusiasts will recognise this length as representing two five-eighth aerials end to end. The ⅝ wave length rod, whip, or wire has been recognised by CBers, Novices and VHF'ers for years to have an advantage over a quarter wave element — same directivity, but more gain! It is not surprising to find that HF arrays, including the international broadcasting systems, use these extended halfwaves as well as basic halfwave dipoles as elements in major driven arrays.

How can we make use of these dipoles other than in their own right? We use them to build a "phased array".

Collinear Arrays

These aerials are the result of "in line" combination of dipoles, which may be less than or greater than one half wavelength. These dipoles are usually end fed, and up to four can be found in a typical array. More than four are rarely found in any array.

Their use in vertical arrays is popular, for omnidirectional VHF, FM systems. Gain is usually 1.8 dBd for a two element ½ wave dipole array, increasing to 3 dBd for two extended (⅝ wave) elements. An array with four halfwave elements could give up to 4.5 dBd gain.

Bidirectional property can be obtained if all elements are fed "in phase", achieved usually by the use of phasing lines.

Collinear antennas may be built in a number of different configurations — they may be stacked horizontally in line, with suitable phasing, or vertically one above the other again with suitable phasing. Parasitic directors and/or reflectors may also be used to enhance the overall gain. Most country amateurs will be familiar with the Hills CA 16, phased TV array, which is an example of such stacking.

End Fire Arrays

These are, in effect, collinear arrays of dipoles, spaced appropriately and driven with the necessary phasing difference. "End" in this case can be best understood by considering a tennis court where the side lines are two elements — the direction of fire is in the line of the net (ie from one side to another).

These elements could be halfwaves, extended halfwaves, halfwaves in phase or extended halfwaves in phase.

In some circumstances a parasitic reflector or director may also be used to enhance the gain.

"Stacking" is done in the same plane, that is, tennis courts are laid end to end in a row, and elements phased appropriately. The system then becomes a one, two, three or four section, end fire array.

The array is still end fire, even if it is totally picked up and changed in polarity. ie it could become a vertical incidence radiator by pointing the main lobe vertically skywards, or a vertically polarised array by setting the "tennis court side lines" vertical. End fire antenna element spacing usually varies between ⅛ wave to ¼ wave, and in HF/DX band applications, are horizontally polarised — there is no reason such an array should not be suspended vertically if vertical polarisation is required as in 28 MHz extended ground wave application.

These arrays may be stacked one above the other, and with appropriate phasing may be very useful in specific situations. The elements may be phased for bidirectional or unidirectional radiation.

Broadside Array

The description of this array conjures up a better understanding of the direction of radiation than does the term "end-fire". Imagine our tennis court analogy and the side lines being the radiators — in this case the radiation is in the vertically upwards (skywards) direction. These arrays for HF are usually suspended from one side to allow horizontal polarisation across the surface of the earth, and again may be suspended from the ends to give vertical polarisation.

Spacing between elements is usually between ¼ to ½ wave.

A Broadside array, suitably spaced above ground, may be found in use in tropical broadcasting, in bands below 4 MHz, for vertical incidence application where it fires direct at the ionosphere for a signal reflection into the immediate adjacent area — an elaborate ground mat is required in such circumstances.

Practical Antennas

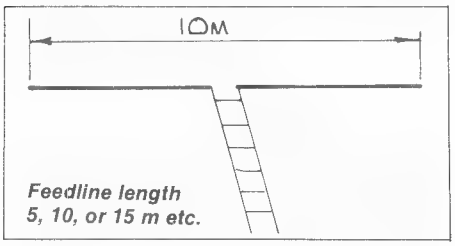
The following practical antennas represent all of the above types, and may be found in use in numerous amateur stations throughout the world. They also appear in most "Handbooks", and a variety of methods of erection and adjustment have been covered in specific articles in electronics periodicals throughout the world.

Most designs are based on the 14 MHz band and may be suitably dimensioned for any other band as required. A halfwave being physically $\frac{143}{f(\text{MHz})}$ metres.

Single Wires

Dipole

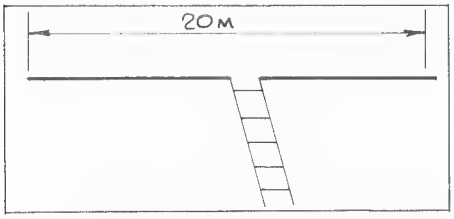
(a) A halfwave dipole, fed with coaxial cable may be useful on its fundamental and odd harmonics (usually only 3rd and 5th). If fed in the centre with a tuned line it may also be used with gain (1.8 dBd) on its second harmonic (known as a centre fed Zepp).



Gain	14 MHz	0 dBd
	18 MHz	0 dBd
	21 MHz	1.0 dBd
	28 MHz	1.8 dBd

Above 35 MHz where the gain is 3.0 dBd the bi-directional main lobes split into multi-directional lobes making it relatively difficult to determine directivity although the resultant lobes do have useful gain.

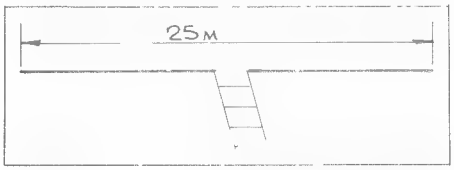
(b) This antenna becomes two halfwaves in phase on 14 MHz



Gain	7 MHz	0 dBd
	10 MHz	1 dBd
	14 MHz	1.8 dBd
	18 MHz	3.0 dBd

Above 18 MHz multi-lobes appear.

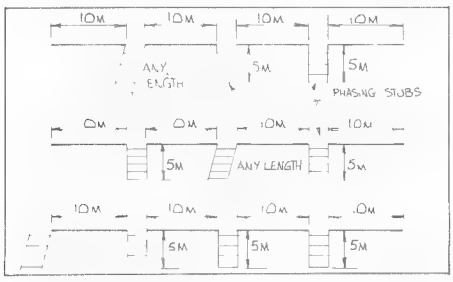
(c) This is the extended two half waves (2 x ⅝) configuration. This is perhaps the most useful multi-band dipole configuration for suburban backyards. It is slightly shorter than the length (102') recommended by G5RV, however, at 14 MHz it is bi-directional, with gain.



Gain	3.5 MHz	0 dBd
	7.0 MHz	1 dBd
	10.0 MHz	1.8 dBd
	14.0 MHz	3.0 dBd

Above 14 MHz multi-lobes appear.

Phased Dipoles (Franklin Antenna Array)



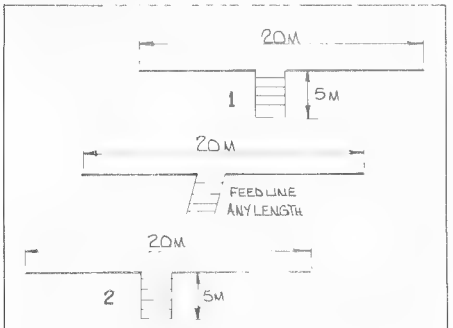
Above are the endfed, centrefed and off-centrefed configurations suitable for multi-band use.

Gain	3.5 MHz	0 dBd
	7.0 MHz	1.8 dBd
	10.0 MHz	3.0 dBd
	14.0 MHz	4.5 dBd

Above 14 MHz multi-lobes appear, destroying bi-directional gain properties. Phasing stubs: These are electrical halfwave phase-shift networks and may be calculated or cut using a GDO to the correct length — ¼ wave of 600 ohm transmission line is suitable.

6 Element Collinear with Parasitic Elements

General: This antenna is in effect a halfwave in-phase driven element, with appropriately phased and adjusted reflectors and directors.
Source: Ron Kelton VK5ZR — Used extensively 1947-1955



1 & 2 Stub tuned directors and reflectors approx 5 m long.

Estimated gain: 8-9 dBd
Band-width: 14 MHz only as a beam, but useful on all HF bands for general work.

Adjustment: Shorting bars on 1 and 2 may be moved up and down for maximum gain and front to back. Start at 4.9 m for director and 5.2 m for reflector. Feedline is fed through ATU.

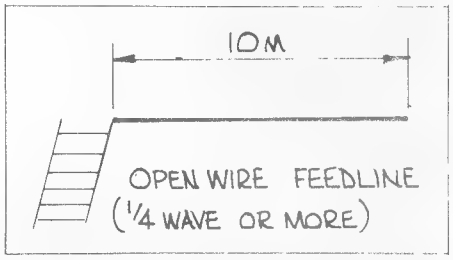
Special Considerations: The position of the shorts on the parasitic elements can, once located, be varied by relays, or "pull" switches, to reverse the direction of the beam.

End-Fed Dipole

A halfwave dipole, fed at one end with a non radiating feedline, exhibits bi-directional radiation properties on its resonant frequency only. At other frequencies major and minor lobes appear and its use on harmonics for gain purposes can only be practical when considering harmonics above say the fourth or fifth.

The resultant aerial is usually known as the end-fed "Zepp" — actually the figure 8 pattern of the dipole radiation, and symmetry of the lobes used on harmonics, is somewhat distorted, to give a directional radiation away from the feeder end. These aspects are worthy of further reading; however for a "backyard" installation, its application is somewhat limited if directivity is required.

The above aspects however do not preclude the end fed dipole being used as the driven element of a collinear phased array.

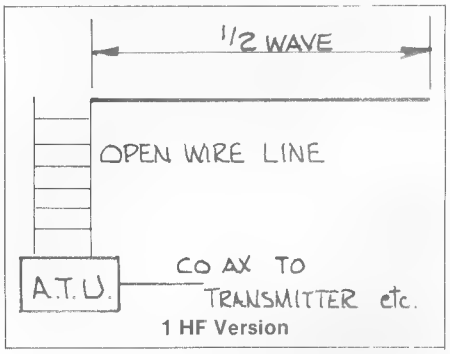


Maximum gain possible in any of these five configurations is 3 dBd ie two areas with unity power can only produce twice power under any condition.

End-Fed Zepp

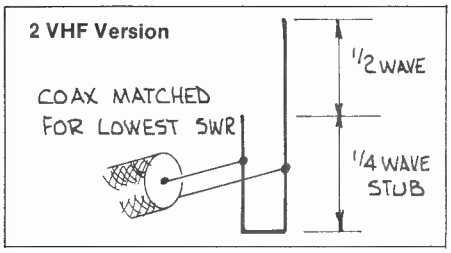
This term is used to describe a wire antenna, usually halfwave or longer, that is fed by a parallel wire feedline, at one end. One side of the feedline is connected to the antenna wire, and the other is unterminated

The line is fed as a tuned feeder, via an ATU or with the use of stubs, by a coaxial cable. In VHF mobile use, it usually shows up as a "J" type antenna.



1 HF Version

Share an Experience
Write an article for Amateur Radio



Only the antenna radiates, there being no radiation from the feedline — on harmonic frequencies (1 wave, 3/2 wave etc) the bi-directional dipole pattern becomes a multi-lobe system, which is not symmetrical about the wire — it is in effect slightly directional along lobes that radiate away from the feedline.

This antenna is more useful than the end-fed against ground type — whilst the ATU and the equipment must still be efficiently earthed less problems with RF feedback may be in evidence. Additionally, the use of this feedline technique ensures that no induced interference from power wiring is picked up by the line — a good quality signal received by the horizontal section, in a noise free location, can be ruined if the feedline passes close to household wiring. The balanced feeder reduces this additional noise pick up.

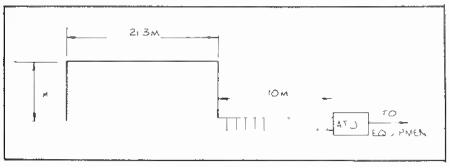
This principle is used for a number of commercial broadcast band noise elimination antennas that have been popular over the years.

Amateur Band use: A popular dimension for this antenna has been a 21 metre horizontal wire, end-fed with approximately 10 metres of tuned parallel line. The system tunes up nicely on 3.5 to 28 MHz for a general purpose all band antenna.

The writer sees no reason why such an antenna should not continue to be useful where end-feed is necessary.

Inverted "Bathtub"

Mr John E. DeCure, VK5KO, in 1948 to 1960 spent a lot of time researching the DX paths available on 3.5 MHz. A backyard limitation, with 12 metre high poles at 23 metre separation, and a need for end feeding, saw him install a 3.5 MHz dipole in the inverted "U" configuration, ie vertical 11 m, horizontal 21.3 m and vertical 11 m. A 10 metre tuned feedline connected the bottom of one vertical section back to the antenna tuner etc.



The feedline may be raised a little above head height, or held out from the post and rail fence by a stand off-system.

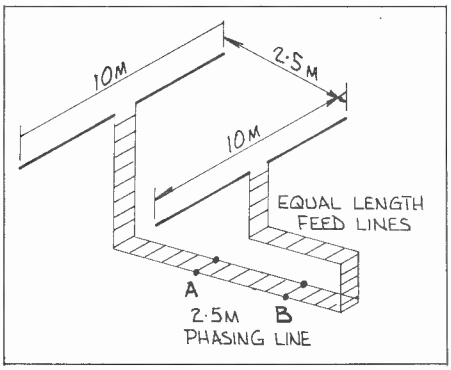
One interesting thing about the antenna was its omnidirectional pattern, and effectiveness as a DX antenna on all bands 3.5 MHz to 52 MHz.

In addition the writer has used the same dimensions for a 160 metre antenna — on this configuration the ATU was put at the base of the 11 m vertical section and fed to the equipment with coaxial cable — a significant earthing/radial system using bonded galvanised fencing was also used.

G8PO Antenna

This antenna is another version of the two element end fire phased array. My attempts to locate the original article that appeared in the Australian Electronics Press about 1948, have been unsuccessful.

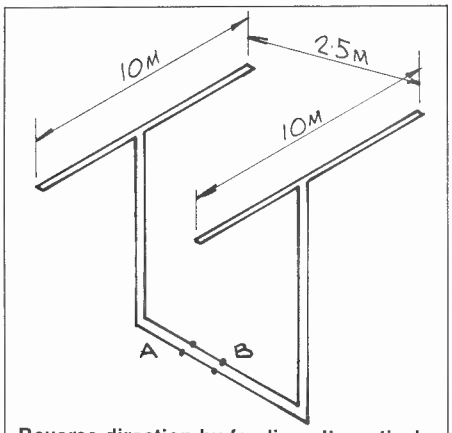
Two versions of the antenna were popular:



Two 10 metre wire dipoles were spaced 2.5 metres apart, and feed lines of equal length were run into the "shack". Phasing between the two elements was arranged by feeding power into one feeder terminal, whilst power to the other went through a transposed phasing line of about 2.5 metres.

Beam reversal was possible by feeding power to the bottom of the alternative feed line. On receive, the front to back ratio could be adjusted for maximum by changing the length of the phasing line — eg listen to a strong station in line with the main beam, reverse the feed point, and adjust the length of phasing line until the station is weakest.

A similar antenna made of 300 ohm ribbon was also popular — my own experience with this antenna was very successful.

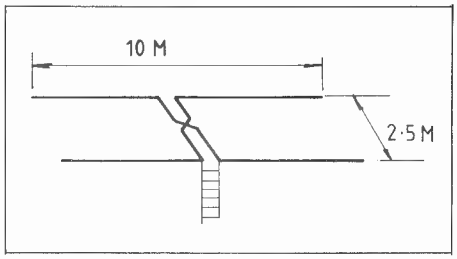


Reverse direction by feeding alternatively at A or B to ATU

The polar diagram for such dipoles 135° out of phase is a cardioid — however in practice a number of these antennas have shown excellent side rejection, which may have been due to individual location paramaters, such as height, foliage etc. (See reference.)

ZL Special

Another two element phased array, used extensively over the last thirty years — it is the same two dipoles as in the previous G8PO configuration, however, only one feedline is required, the phasing section being located directly at the dipole feed points.



Matching of the antenna to open wire line may be by way of a ¼ wave transformer using 70 ohms twin lead, although a direct 50 ohm to 22 ohm balun connected direct to the centre of the driven element would allow use of 50 ohm coaxial cable — otherwise use tuned line for multiband use.

The antenna has been described in a number of forms — locally in South Australia the two dipoles, spaced ⅛ wave, made of aluminium tubing or wire was popular between 1950 and 1970 — overseas, folded dipole elements were preferred using 16 mm to 25 mm diameter tubes spaced up to two metres apart, often with the driven element being shorter than the reflector.

Some ingenuity in a "flip over" of the array will allow reversal of the beam direction.

The following extract from "Radiocommunication" (RSGB) may be of interest:

Unidirectional driven arrays (monoband)

George Brown showed that when two elements are fed 135° out-of-phase with equal amplitudes a cardioid-type pattern results. Over the past forty five years various ways of implementing such arrays as flat-top beams have been devised, of which the "HB9CV" and "ZL-Special" are among the better known, although the "G8PO" enjoyed a brief spell of popularity for fixed arrays because it was readily reversible.

The ZL-Special was so named and first described in print by Fred Judd, G2BCX. Although the design is often also credited to G2BCX, his original article in Short Wave Magazine (July 1950, pp 337-9) made the position clear: "Data on the aerial to be described came to the writer from New Zealand, hence the name ZL-Special. Little is known of its origin save that it was designed in the USA, just prior to the late war, for commercial purposes. Since the war it has been modified and developed for amateur use by W5LHI, W0GZR and ZL3MH. Further tests and measurements made by the writer may be of interest". A later writer confirmed that in 1949 ZL3MH was using the system on 14 and 28 MHz "with outstanding results."

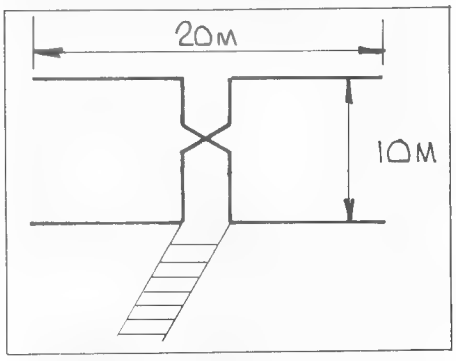
"The ZL-Special, of which there are several slightly different versions, basically consists of two close-spaced dipole elements, both of which are driven (preferably with near equal amplitudes) with a phase difference of approximately 135°. The 135° difference is achieved by using ¼ wave (45°) phasing section which is transposed so that 180° - 45° = 135°. The elements may be folded-wire dipoles or rod elements; one version uses 300 ohm twin cable throughout, another uses coaxial feeder and rod elements.

A more sophisticated version of what is essentially the same form of antenna was developed by Rudolf Baumgartner, HB9CV. In this case, self-supporting rod elements are normally used with T-match or gamma match

sections between the transposed phasing section and the driven.

The Lazy "H" Antenna

This antenna is an example of a broadside array. It consists of two collinear arrays stacked one above the other.



The separate collinear sections may be a halfwave dipole, a double dipole (two halfwaves in phase) or two extended halfwaves in phase.

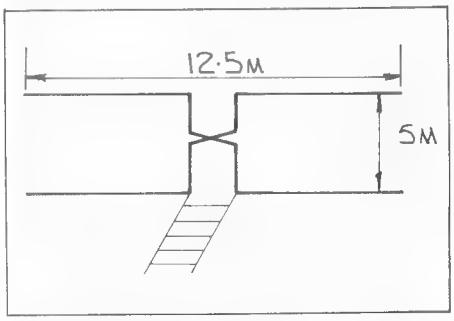
Vertical spacing is usually a halfwave length at the lowest frequency of use.

The dimensions listed above were used by the writer at Macquarie Island (VK1RG) in 1952/53, and provided successful bi-directional gain on 7, 14, and 21 MHz. The top element was 25 metres high, and the bottom 15 metres — the array was strung between two convenient 25 metre Kelly and Lewis metal guyed masts, and required much less maintenance (wind storms, ice etc) than a nearby 200 metre per leg "V" beam. Additionally, it appeared to have comparable gain.

The estimated gain of the above would be 3 dBd on 7 MHz and 5 dBd on 14 MHz. It would also have useful gain on 10 MHz of course.

In International Broadcasting, such arrays are also popular, usually with a director associated with each element, to give yet a further 3 dBd gain.

The antenna had appealed to me as I had earlier (VK2ARQ 1949-1952) used a Lazy "H" on 28 MHz from Sydney with good results. Its dimensions were:

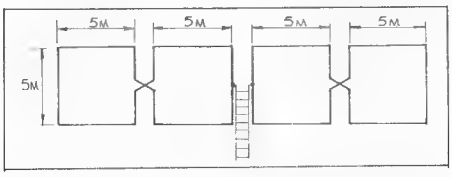


The collinear elements were actually two extended halfwaves in phase — gain was in the order of 6 dBd.

This was also successful on 14 MHz where its gain would be approximately 3 dBd.

The practical benefits of such an antenna where larger poles may be erected, are worth considering — three 15 to 20 metre poles, set up as an equilateral triangle, with such arrays between each pole, would give six point (with wide beam-width) coverage of the world — no rotation of the array, only a three position, double pole switch, to select the appropriate feedline! Don't feel bound to the HF Bands for using the Lazy "H" — on VHF, particularly on 146 MHz it is very popular.

Bruce Array



A similar form to the Sterba Curtain, however, a little more practical for 14 MHz, as height of the array is only ¼ wavelength (5 m).

Height above ground should be at least four metres.

Gain is 5 dBd on 14 MHz and on 28 MHz it is up to 9 dBd. Well worth considering as it can be used as a 3.5 and 7 MHz dipole also.

On 21 MHz, it is still bi-directional with a gain of 7 dBd.

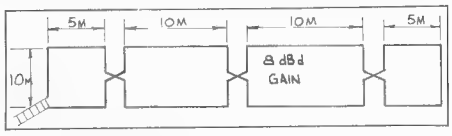
Sterba Curtain Array

This array consists of stacked/driven/collinear elements as shown. It has halfwave spacing which for 14 MHz requires not only height, but also good spacing between support poles.

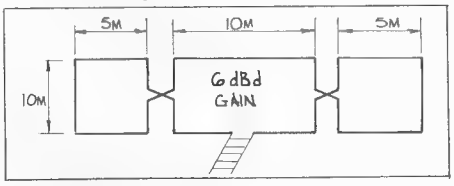
The closed DC loop configuration makes it easy to check for broken sections, from the amateur shack using an ohm meter.

I have not heard of many of these being used on 14 MHz, however, they have been very popular on 28 MHz.

Gain is in the order 8 dBd for the example shown (14 MHz). The antenna would be useful for higher (and lower) bands, however, gain and radiation patterns are not known to the author.



or alternatively



The W8JK Antenna

This is an end-fire array in which the elements are all driven (as compared to the yagi which utilises parasitic elements). (See reference 14.)

The driven elements can also be collinear elements. It has a number of useful features that make it attractive as a multipurpose, multiband antenna including:

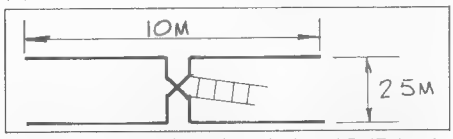
1. *Not as seriously influenced by height above ground as a similar sized yagi array.*
2. *Useful as a multiband antenna.*
3. *Symmetrical in its construction.*
4. *Adjustments made at ATU, not at antenna.*
5. *Has reasonable gain.*
6. *Is bi-directional.*

My own experience has revealed it to be a good choice for a fixed wire antenna for any location. I have also used it as a rotary beam antenna, and as such it only requires 180° rotation for all round coverage.

Included are single section, double section etc, versions — stacking is also possible.

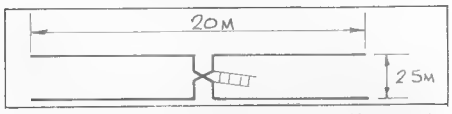
The most successful simple versions for suburban backyard use would be the following forms:

(a)



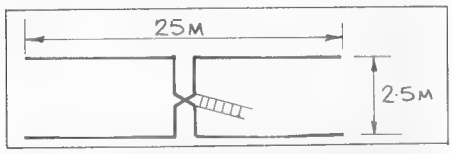
This combination gives 3, 4 and 5 dBd gain on 14, 21 and 28 MHz respectively.

(b)



This version in effect uses two halfwaves in phase, each driven, for gains of 5 dBd and 6 dBd on 14 and 21 MHz, however, on 28 MHz the lobes break up and whilst having useful gain, are multidirectional.

(c)



The driven elements in this version are extended halfwaves in phase to give 6 dBd gain on 14 MHz. The lobes on 21 MHz and 28 MHz, whilst useful and possessing high gain, are in odd positions, and orientation of the antenna for gain use on 14 MHz seems the most practical.

This version was used extensively by one VK5 Amateur for many years to maintain a top DX position on 14 MHz. Also used by myself as VK9RO, from Port Moresby (TPNG) in 1958-62.

The following useful notes are extracted from "Radiocommunication" (RSGB):

A New Look at the W8JK

For many years the W8JK, first of the "flat-topped" close-spaced arrays, has suffered a decline in popularity when compared with the unidirectional yagi and the various unidirectional driven arrays discussed below. All close-spaced arrays, driven and parasitic, unidirectional and bi-directional arrays derive from the basic work at RCA of Dr G H Brown (Proc IRE January 1937, pp 78-145). Historically, the driven bi-directional arrays of Dr John Kraus, W8JK, of Ohio State University, were the first flat-top arrays to become popular on the amateur HF bands from 1937-38 onwards, both for rotary and fixed arrays.

In Ham Radio (July 1981, pp 60-63) Frank Regier, OD5CG, of the American University of Beirut, takes "A new look at the W8JK antenna". He goes right back to the original design based on two close-spaced transposed dipoles centre-fed 180° out of phase with balanced line. He shows that despite the disadvantages of bi-directivity for reception, lower gain (at resonance) than an equivalent yagi, and its low radiation resistance, the W8JK does possess some useful advantages.

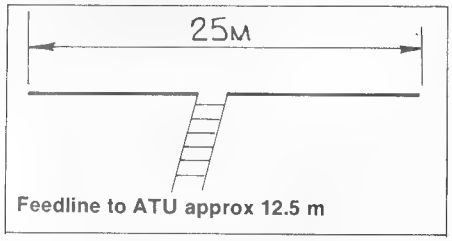
He draws particular attention to the fact that, as with the centre-fed dipole, it will operate reasonably satisfactorily over something like a 2.5 to 1 frequency span, with gain

increasing on the higher-frequency bands. Theoretical free-space gain with half wave elements is about 4-4.5 dB, but this increases to about 6 dB at twice resonant frequency, and up to 7 dB at 2.5 times resonant frequency. In practice rather lower gains can be expected. Element spacing is relatively uncritical and ⅛ wave spacing at the design frequency remains satisfactory throughout the frequency span. Finally, he claims that such an array will work surprisingly well at low heights where it does not suffer from the detuning effect of earth which tends to degrade yagi performance.

OD5CG in fact claims that the W8JK array can out perform an equivalent three-element yagi array when the height is less than about halfwave above ground, provided that the symmetry of the W8JK array is maintained (ie it is all sufficiently far away from nearby structures, trees etc). It gives good results on every band from 10 to 28 MHz (including good reception on the various broadcast bands), though his own array is smaller — 10 m, 2.5 m spacing, and is for 14 to 28 MHz. He uses 300 ohms balanced twin feeder, which is convenient except "when it rains, when the impedance tends to become erratic (open-wire line avoids this problem)."

My Recommendations

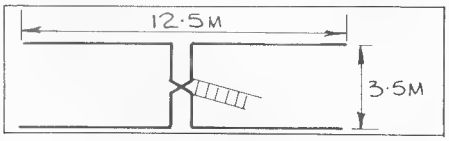
A. Multiband General purpose array.



This antenna has the following radiation properties:

1. 1.8 MHz — tie feeders together and load against ground — omnidirectional.
2. 3.5 MHz — shortened dipole — excellent general coverage.
3. 7.0 MHz — extended dipole — a little bi-directional gain, at right angles to the wire.
4. 10.0 MHz — shortened two halfwaves in phase — some bi-directional gain 1.8 dBd.
5. 14.0 MHz — two extended halfwaves in phase — 3 dBd gain.
6. 18, 21 and 28 MHz — a general purpose long wire (centre fed Zepp) with multiple lobes, some with useful gain (eg wire is 2½ waves long on 28 MHz for gain of 2 dBd in each of four lobes at 30° with respect to the wire). This aspect of long wire aerial gain is treated elsewhere.

B. A W8JK array for 10 MHz as a gain antenna



Useful on various bands as follows:

1. 10 MHz — single section W8JK with gain of 3 dBd over dipole.
   14 MHz, 18 MHz — extended halfwaves for driven dipoles, for 4 dBd gain.
   21 MHz — driven elements equal to two halfwaves in phase, for 5 dBd gain.
   24 MHz, 28 MHz — driven elements equal to two extended halfwaves in phase — array gain is 6 dBd.

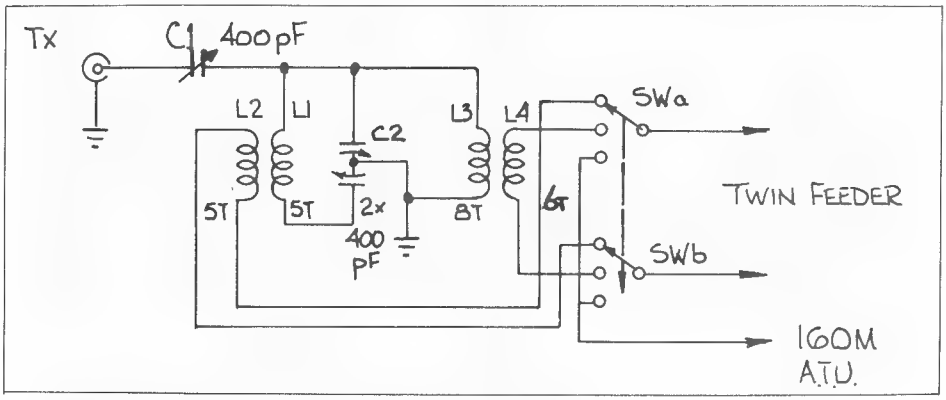
The "Z" Match Antenna Coupling Unit

The "Z" Match antenna coupling unit has been very popular for a number of years, since it was featured in ARRL and RSGB publications. Many units have been home-brewed using both ARRL and RSGB coil dimensions and layouts.

A UK manufacturer markets a version as the KW EZEE MATCH and judging by photographs in British magazines it still sells well there, but the last Australian price I heard was in excess of $100.

I have had success with the RSGB version and have now built a number of these. My modified version has been copied by several VKs. While the RSGB description gives excellent information on coil construction, the suggested layout gives extremely long leads to the 14-30 MHz range coil, which is overcome in the modified version.

On both the RSGB and ARRL circuits, each link is marked for 3.5/7 or 14/21/28 MHz, which has caused difficulties for many constructors, as some feedline lengths present impedances to the coupler which may be matched better by an alternative connection. I solved this problem by using a 3-position 2-pole switch which allows the twin feeder to be connected to either link (positions 1 and 2) or to the external terminal mounted on the rear panel of the coupler (position 3). This terminal allows the twin feeder to be used as a top-loaded vertical antenna on 1.8 MHz through an additional antenna coupler or as a general coverage receiving antenna.



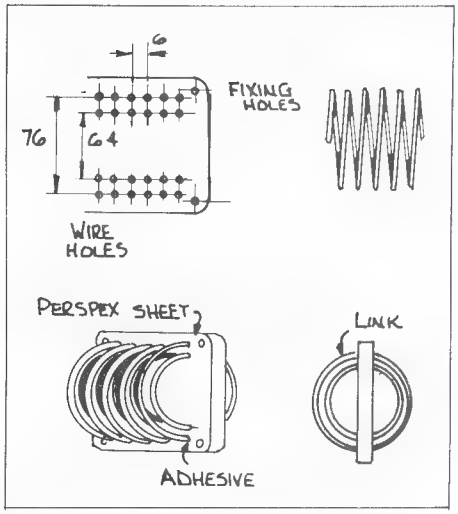
The coils may be 63 mm and 75 mm in diameter, as shown in the diagrams, and 14 to 16 SWG wire is suitable. The coils should first be wound around a cylindrical former (eg an electrolytic capacitor) of smaller diameter, and then threaded into the holes in the Perspex support. A suitable adhesive (eg plastic cement) may be used to fix the coils in the holes.

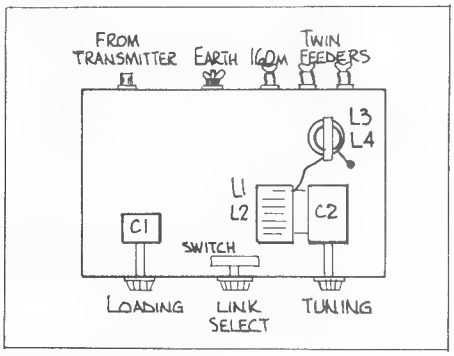
For power up to 100 watts, standard single and two-gang broadcast receiver tuning capacitors are quite suitable. For higher power, a pair of transmitting variable capacitors, with adequate plate spacing, should be used. Note that C1 needs to be insulated from ground and from the COUPLING control knob. The frame and rotor of C1 should be connected to the transmitter output, while the stationary plates should be connected to L1.

The "Z" Match is constructed on a simple U-shaped chassis, with a second U-shape of perforated metal as a top cover. The front panel controls are LOADING, LINK SELECTION and TUNING.

The unit should be used with a good earthing system. A minimum 1.5 m length of ¾" galvanised water pipe should be driven into the ground immediately behind the antenna coupler and connected directly by a length of 4 mm² or larger copper wire between the earth terminal and a clamp on the pipe. One metre to two metres of wire should be enough. Additionally, bonding to nearby water pipes, galvanised steel carports or other earthed structures will improve efficiency when using unbalanced-feed antennas.

From SA WIA Journal August '79





Dimensions

Dimensions given above are suitable for generally satisfactory results, however for the

theorists, the following may be more accurate:

Length of basic halfwave is $\frac{143}{f(MHz)}$ metres.

Length of Reflectors = $\frac{1.05 \times 143}{f(MHz)}$ metres.

Length of Directors = $\frac{.95 \times 143}{f(MHz)}$ metres.

For 14 MHz.

	Director	Reflector	Dipole
⅛ wavelength			2.518 m
¼ wavelength			5.035 m
½ wavelength	9.567	10.574	10.070 m
⅝ wavelength			12.588 m

The most desirable feedline lengths for multiband operation are those where the ATU is presented with a high or low impedance load — this is achieved where the total wire length from antenna tip to ATU is an integral number of quarter waves eg 10 m, 15 m, 30 m etc.

Conclusion

I trust the above discourse is of interest to some amateurs. A large number of antenna arrays may be erected in suburban backyards, on relatively low masts, but have effective DX capability. An additional aspect is the frequency agility of these arrays when associated with a suitable multiband antenna coupling unit.

There are benefits to be obtained, reducing stray RF at the operating location, by the use of symmetrical or balanced feed, as against the use of a long single wire system. Noise reduction aerials work on the end-fed, balanced feeder principle.

The expense of experimentation with such aspects of amateur radio is well worth while —the propagation experiments and improved knowledge of antenna theory that can result are limitless.

Assistance

Comments from VK5ZR, VK5RN, VK5DI on their own experiments with phased arrays were appreciated. Thanks also to Ray, VK5DI for constructive criticism on the script! Also thanks to VK2PMF for his unintentional prod to write something useful in AR. (See p 32 December 1982.)

References:

— ARRL Antenna Book — Driven Arrays, pp 6-4 to 6-14
— ARRL Antenna Book — Long Wire antennas pp 7-1 to 7-10
— Amateur Radio Techniques 5th Edition — Pat Hawker G3VA, — Radiation patterns, p 252, fig 73
— Amateur Radio Techniques, — Bruce Array, p 231, fig 30
— Radio Handbook, 20th Edition, Collinear Arrays pp 28 11 to 28 18
— Radio Handbook — W8JK Arrays p 28.16 fig 30
Junk Box ATU — Cook, VK3AFW AR March 83
— Coming, Ready or Not, — Cook, VK3AFW AR January 82
— Multiband Dipoles, — Cook, VK3AFW AR September 82
— A 20 metre vertical, — Weller, VK3YX AR December 82
— A Curtain goes up — Schultz W2EEY/1 "73" Aug 66
— An All Band Curtain Array — Shawsmith VK4SS AR May 67
— Extended, expanded collinear array — Schmidt W2EA QST Dec 81
— The W8JK Antenna; Recap and Update — Kraus W8JK QST August 82
— W8JK 5 Band Rotary Beam Antenna — Kraus W8JK QST July 70
— Antenna Tuners — Ron Cook, VK3AFW AR Feb and Mar 83
Novice Notes — Ron Cook, VK3AFW AR July 83
— 30 Metre Antenna — Ron Cook, VK3AFW AR January 82
— Extended Double Zepp — ARRL Antenna Book, 14th Edition, p 608
— Two Element Driven Arrays — Moxon G6XN QST July 1952
— A G8PO without cut and try — Jones VK3BG AR January 1952
— 8PO Aerial AR June 1952, p 5
— HF Antennas for all locations (book) — Moxon G6XN RSGB 1982

AR

IMPROVED PEAK POWER INDICATOR

Ivan Hüser VK5QV
7 Bond Street, Mount Gambier, SA 5290

The addition of this simple peak power indicator will make your power meter somewhat more meaningful.

The original design for a peak power indicator was first described some years ago in an article[1] by Harold Hepburn VK3AFQ.

The circuit used a sensing head consisting of several resistors in series across the transmitter (50 Ω) output to form a voltage divider. The reduced RF voltage obtained from this divider was rectified, filtered and fed to a voltage level detector. Means was provided to enable the unit to be calibrated such that a LED flashed each time the power exceeded a pre-determined value.

Having built the unit, it was found to be quite frequency dependent and hence only really useful on one band. The project was then temporarily shelved.

A modified version of this device was described recently in an overseas magazine[2] which prompted me to engage in further experimentation. This new version had a small 'gimmick' compensating capacitor connected across the top section of the voltage divider to offset the detector circuit capacitance. *See Fig. 1.* The amount of capacitance needed was something in the order of 0.5 pF which made it almost impossible to adjust.

After an unsuccessful attempt lasting nearly two days (I'm a slow learner) to get the circuit operating satisfactorily, it occurred to me that I already had on hand a frequency independent wattmeter built into my FC902 antenna coupling unit.

This wattmeter uses a circuit similar to that shown in Fig 2 and is of a type often built by home constructors and also found in commercial equipment.

A quick test showed that the output from the 'forward' detector of my wattmeter was in the region of 2.7V DC with a transmitter output power of 400W PEP into a 50 ohm dummy load. The problem then was to design a level detector for this voltage.

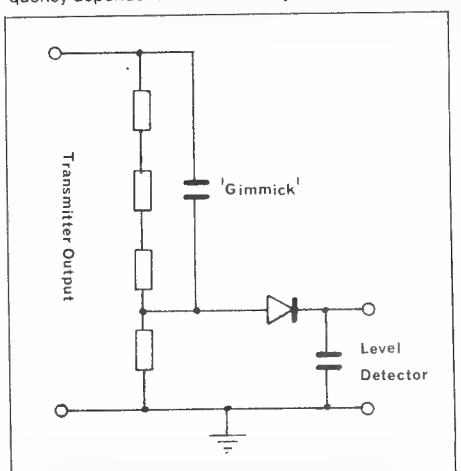


Figure 1 — Original Sensing Head

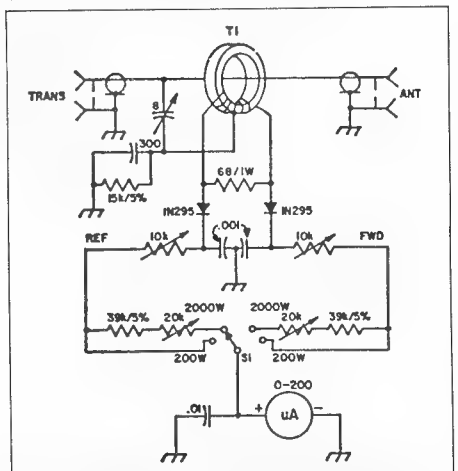


Figure 2 — Wattmeter Circuit

LEVEL DETECTOR

The DC output voltage from the wattmeter is fed into a resistive voltage divider. This voltage divider is made adjustable to enable the trip point to be accurately set. The resistor values may have to be changed slightly to suit the particular wattmeter.

One section of the LM324 quad op-amp (IC1a) is connected as a unity gain follower or buffer amplifier. See Fig 3. This gives a high input impedance so that the device does not load the wattmeter metering circuit to any great degree. The input resistance of the peak power indicator will be approximately equal to the total resistance of the voltage divider (150k).

The output from the buffer is compared with the voltage at the non-inverting input of the inverting comparator (IC1b). This voltage is determined by the 6k8 and 1k resistors. When the input to the comparator exceeds the voltage at the non-inverting input, the output goes low and the LED will be illuminated.

The 2u2 capacitor and 1M resistor provides a time constant to ensure a slight delay before the LED extinguishes after each peak power indication. The value of these components may be varied to suit the voice characteristics of the operator. The diode on the output

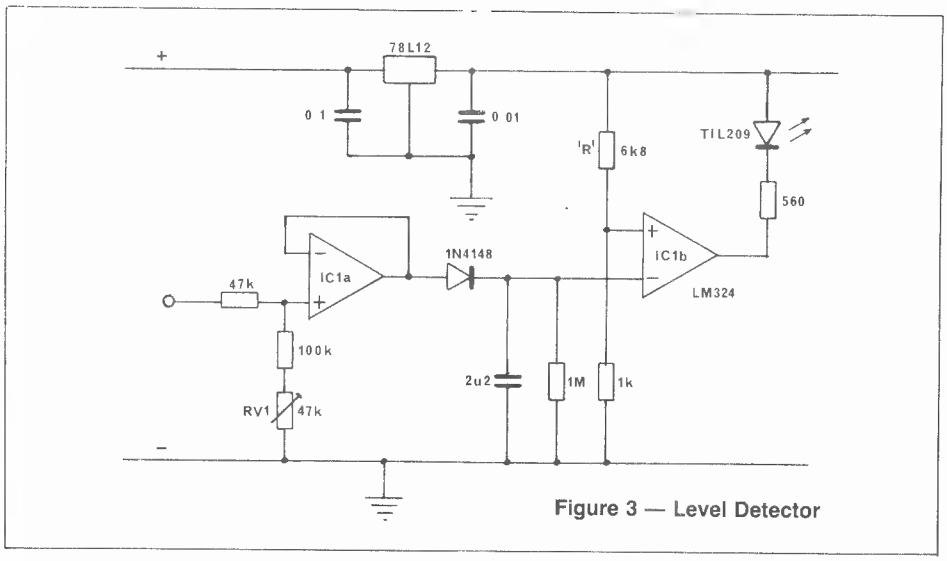


Figure 3 — Level Detector

of the buffer isolates the low output impedance of IC1a from the time constant section ensuring a more accurate delay time.

The level detector is operated from a nominal 12V regulated supply. The input to the 78L12 regulator should be between 14.5V and 19V for good regulation. This may be obtained from a suitable plug pack or a rectified and filtered AC source such as a dial light supply.

TABLE 1.

Value of 'R' (ohms)	4k7	6k8	10k	15k	33k	47k	100k	220k	470k
Input Voltage (volts)	3.4	2.6	2.0	1.5	0.9	0.7	0.47	0.33	0.21

Table 1 shows the approximate values of input voltage necessary to trigger the circuit for various values of 'R'. A value of 'R' may be selected to match the output voltage from the wattmeter or if a different power indication is required.

CONSTRUCTION

It is suggested that the unit be first constructed on a breadboard so that any variations in component values can be established. Once the component values have been confirmed and the unit operating correctly, it can be built on a small printed circuit board. The foil pattern and component overlay is shown in Fig 4.

If possible, the peak power indicator should be mounted in the same box as the wattmeter but remote from any source of RF.

Resistors are ¼ watt and the trimpot a horizontal mounting cermet type. Low value capacitors are 100V 'greencaps' and the 2u2 a tantalum. A socket may be used for the LM324.

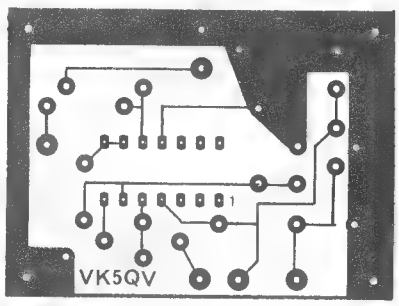
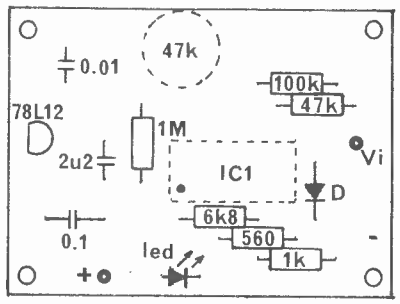


Figure 4 (a) PCB Pattern

CALIBRATION

The peak power indicator may be calibrated quite readily against your existing power meter.

With the transmitter operating into a dummy load and



(b) Component Layout.

a two-tone signal fed into the transmitter, adjust the output to the desired power indicated by the wattmeter. RV1 should now be adjusted until the LED just lights.

To check the setting, reduce the transmitter power and then slowly increase it until the LED just lights. The wattmeter should read the correct power.

The unit may also be calibrated using an RF ammeter. A current of 2A into a 50 ohm dummy load will indicate 400W PEP with two tones into the transmitter.[3] Care should be taken to make sure the dummy load is not overheated. My dummy load has a cold resistance of around 47 ohms which increases to something like 73 ohms when very hot — not ideal when trying to calibrate a power meter.

FINALE

I built my peak power indicator into the FC902 antenna tuning unit with the LED protruding through the power meter scale. In use, the occasional flash of the LED indicates that for a fraction of a second I have broken the law — Hi!

NOTES

1 Sideband Power — Harold Hepburn VK3AFQ — Amateur Radio Action Vol 3 No 5

2 Measurement of PEP Output Power — H L Hepburn VK3AFQ — Ham Radio June 1983

3 Amateur Operator's Handbook Revised December 1978— Paragraph 5.43

AR

Photographs and Technical Articles are always welcome by AR

QSP

DIRECT DIALLING THE WORLD

The world's largest and most advanced international telephone exchange has officially opened at Vauxhall in London. It can handle 140,000 calls an hour.

The British Telecom International (BTI) exchange will cater for the ever increasing growth of international telephone calls — currently doubling every five years. At present, some 362 million calls a year are made in and out of the UK and that number is expected to reach 1,000 million by 1985.

The new computer controlled exchange will be used mainly to switch directly dialled calls on the busiest routes, between the UK and the United States, France, Federal Germany, Australia, Japan and Hong Kong.

About one million telephone calls are made in and out of the UK every day through one of the most advanced international telephone networks in the world. All British telephone users can now dial international calls direct to more than 130 countries without going through an operator. International calls are carried by satellite or cable while some are transmitted by microwave.

AR

ASIA TELECOM 85 IN SINGAPORE

The International Telecommunications Union (ITU) and the Telecommunication Authority of Singapore announce that they will jointly organise 'ASIA TELECOM 85, an exhibition and a conference which will be convened from 14th to 19th May, 1985 in Singapore, in pursuance of Opinion No 3, adopted by the ITU Plenipotentiary Conference in Nairobi, Kenya, 1982.

ASIA TELECOM 85 will feature a six-day specialised international telecommunications exhibition of highest standing and a special session of the ITU World Telecommunication FORUM, which is recognised as an authoritative meeting of communications policy-makers, scientists, engineers, users and specialists of ITU's Member countries to informally discuss issues and problems in telecommunication development, especially in the field of integration of services.

Under the theme "The Integration of the World Telecommunication Network — from Challenge to Reality", ASIA TELECOM 85, Exhibition and FORUM, will focus on all aspects of Integrated Services Digital Networks (ISDN), which will provide not only telephony but all types of digital services on a switched basis. The second subject of ASIA TELECOM 85 is Mobile Communications, with special emphasis on the rapidly developing field of cellular radio. The FORUM sessions will feature a number of well-known communications leaders who will discuss technological, policy, operational and users' aspects of ISDN and mobile communications. Held after the CCITT* Plenary Assembly (Malaga-Torremolinos, Spain, 8-19th October, 1984), the Singapore Forum will highlight the latest CCITT Recommendations which will facilitate worldwide information transfer with the accelerated fusion of communications and computer technologies

The Exhibition and Forum are designed to keep visitors in touch with the latest developments in some of these most important areas in telecommunication technology and policy. They offer a unique opportunity for individuals and groups, providers and users of telecommunications, to join in the exchange of ideas, information and technology in selected fields of telecommunications and electronics

For further information, please contact:

ASIA TELECOM 85 Secretariat
ITU/UIT
Place des Nations
CH-1211 Genève 20 (Switzerland)

Telecommunication Authority of Singapore
Comcentre, 26th Storey
31 Exeter Road
Singapore 0923 (Republic of Singapore)

AR

Cover Story:

MODERN TECHNOLOGY ASSISTS THE PRODUCTION OF AMATEUR RADIO

Julie Lane
22 Glenvale Crescent, Mulgrave, Vic 3170

A full page colour cover is an attribute to any publication and the process of obtaining such a cover, as has been asked by many members, can be a mystery to anyone not associated with the printing industry. The following is written to allow an understanding, by all, of the modern state of the art techniques that are available for colour reproduction.

The colour covers that have appeared on Amateur Radio in the past have been scanned by Quadricolor Industries on a Crosfield 540 Scanner. This scanner produced four separations, cyan, magenta, yellow and black. Such additions as type, insignias, colour panels and tint blocks were combined by hand.

The company recently purchased a Crosfield 645IM Digital Laser Scanner that offers many advantages over the existing range of scanners available in its class. This scanner has a tints and border facility that is a means of electronically positioning, by micro processors, various sized pictures and tint blocks within a defined background area. Colour borders can be generated around all pictures and tint blocks to produce a complete assembly in one operation. Masks, borders, sizing and placement of various subjects can be done to the customers specification or the creativity of the operator from three keyboards controlling individual micro processors that are fed to a master micro processor in one operation, without resorting to manual techniques. This facility is unique to Crosfield Electronics.

The advantages of this system are numerous, economically the finished product costs less due to the complete assembly being done in one operation as it is less time consuming, quality is enhanced due to computer control and the results are consistant.

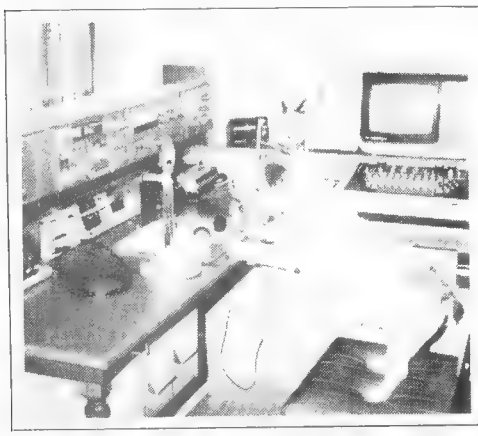
The scanner is divided into two functions that consist of an analytical and processing or exposure segment. The analytical side is where the copy, either transparencies (slides) or reflection copy (prints) that are of high quality as regards density and focus are mounted on an optically perfect perspex rotating cylinder and analysed via lens system. The scanner, through the photo-multiplier, converts the light from its previous state to a digitalised signal, it is then fed to the computer. A xenon lamp is directed through fibre optics to a lens system attached to a viewer where the operator can scan, enhance, adjust and balance through operation of the computer.

The signal from the analytical process, before being sent to the exposure side, that is located in an adjacent photographic darkroom, is split and sent to micro-processors controlling six modulator control boards, one for each of the six laser beams. The modulated laser beams, that commit the desired images, are focussed to form a continuous tone or one of three dot shapes (ie square, circle or oval) onto unexposed film which is attached to another cylinder that is interlocked to the analytical cylinder. The end result, after development of the film, is four monochrome films containing the tone and many thousands of the dot shapes that are separated into colour densities of cyan, magenta, yellow and black. These films are now ready to be exposed by contact onto four lithographic plates ready for colour printing.

The Scan Data Terminal is a Visual Display Unit (VDU) with a standard keyboard, interfaced to two disc drives and a printer. One disc contains programme information necessary for the preparation of tints and borders. Information can be transported from the scanner and stored on the second disc and retrieved for later use. The VDU and printer allows the operator to double check information programmed and also provides a visual display of the layout. Colours can also be created and stored for use as tint blocks and borders.

Cover design by Ray Gillies
Photographs by Ken McLachlan VK3AH

AR



Best Photographs

The winner of the Photograph Competition for 1983-84 was:

Ivan Hüser VK5QV
7 Bond Street,
Mount Gambier, SA. 5209

with his photograph of "Timbo, the second-op" – cover December.

Ivan wins the Agfa camera kindly donated by Agfa-Gevaert Ltd Australia. Shortly we hope to publish a photograph of Ivan receiving his camera from Agfa-Gevaert's representative in Adelaide.

Meanwhile the judges selected the cover photograph as the best photograph for August.

AR

QSP

"THE VULNERABILITY OF SATELLITE COMMUNICATIONS"

It seems only the other day we were being told that HF was an antique mode and satellite was the bright new, "answer to all", communications star.

With all the newly available space weapons, killer satellites, ground laser weapons and the like; communications satellites are not such an attractive choice any more.

The Amateur Service has become very complacement in respect of its HF allocations because commercial interests have tended to vacate the HF bands in favour of satellite systems. Satellite communications were seen by the commercials as the only viable alternative to long distance wired systems.

Everyone interested in the continued well being of the Amateur Radio Service should keep a very close watch on our prime real estate. There are those with commercial interests who would sell their grandmother for half a buck.

To those commercial interests with vulnerable or "burnt-out" satellites, our real estate could be of great financial interest!

VK3QQ
AR

REGULATIONS

Penalties are imposed for offences against the Wireless Telegraphy Act and Regulations by both licensed and unlicensed operators respectively. Unlicensed operation as prescribed under Section 6 of the Act attracts a much higher penalty than that imposed for a breach of the Regulations by licensed operators. Prior to any prosecution action being initiated however, there must be sufficient evidence to substantiate a prima facie case against the person or persons involved.

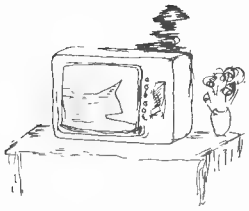
In cases where the authenticity of a station is suspect, amateurs should refrain from communicating with the station in question and note any information that would help in determining the station's location or operator's identity. In this regard it would greatly assist if a detailed log of events were recorded showing for example, date, times, frequency and description of the incident concerned. This information should be referred at the earliest opportunity to the relevant State or District Office of the Department for investigation. I would, however, stress that amateurs should not engage in any investigatory action independent of the Department as such actions could jeopardise the success of Departmental investigations which may be taking place at the same time.

All information provided to the Department on breaches of the Act or Regulations will be investigated in accordance with normal practice. In this regard amateurs should recognize that they may be called upon to give evidence in a court of law if prosecution action arises as a result of such assistance. Tape recordings, unless accompanied by detailed transcripts or supporting evidence to identify the persons in the recording, are unfortunately often of little use during legal proceedings.

If the Amateur Service is to function as intended in the best interests of all participants, it will always be necessary for operators to encourage and foster a degree of self regulation.

AR

SPREAD THE WORD
Join a new WIA member now!!



TRAUMATIC TVI

Robin Gandevia, VK2VN
31 Park Avenue, Randwick, NSW 2031

Sufficient time has elapsed for me to see the humorous side of my harrowing experience with Television Interference.

I moved house from a high density area, where my Kenwood TS 820 transceiver and Hy-Gain 18 AVT vertical aerial had performed with no TVI problems. Once re-installed, I checked that my TV was again free of interference. Space unfortunately required the aerial to be situated about six metres from the neighbour's old Yagi TV aerial.

To help establish good neighbour relations I was most anxious not to cause any TVI. I was also concerned as I had had no practical experience of TVI, and knew that more than theory can be required to eradicate it.

My usual amateur radio activities consist of CW on HF, late evenings, once or twice a week. After three months all appeared well until one evening at midnight, while in contact with Russia, I heard a knock at the door, and I recognised my neighbours' voices. Deciding this was not the best time to discuss the technicalities of TVI with agitated neighbours, I completed the contact before retiring.

Two days later, when my guests had arrived for dinner, and at a crucial time according to my Cordon Bleu recipe, my neighbour reappeared. His problem was as I had anticipated, and after some discussion, we arranged to look into the problem on the weekend. I gave him a Wireless Institute of Australia "Public Information Bulletin" on TVI.

The next day I spoke with a Radio Inspector from the Department of Communications, seeking advice. He kindly offered to investigate the neighbours' TV installation, and subsequently installed a High Pass Filter (HPF) and requested me to run some tests. To do this, my neighbour and I were in contact by phone, somewhat complicated by my new pushbutton phone dialling random numbers each time I activated the transmitter! The filter reduced the TVI, but not satisfactorily, so I went to look myself at my neighbours' TV equipment.

Five metres of 300 ohm ribbon attached with metal tacks through it to the skirting boards terminating at a wall socket with corroded bare wires did not impress me. The coax from the aerial, joining the socket, seemed in good condition. Moving the TV and connecting it directly to this coax reduced the interference. Winding the coax through a ferrite bead further reduced the TVI, suggesting perhaps an earthing problem. This theory was supported when wiggling the TV's coaxial socket affected the reception. I also found that the level of TVI differed between the several pre-set tuners when tuned to the same station. The German set was eight years old according to my neighbours.

I spoke with the Radio Inspector the following day, and discussed my findings. He arranged to lend me a Low Pass Filter (LPF) which established that my transmitter was in order. The inspector then concluded that my neighbour should obtain the services of a reputable TV service company to carry out the following:

1. Replace the section of 300 ohm ribbon with quality coaxial cable.
2. Check the earthing of the TV set.
3. Clean and/or replace pre-set tuning potentiometers.

I gave my neighbours a letter for the serviceman to this effect, requesting the technician to ring me and advise of the work found necessary. Ray and Shirl, a semi-retired couple, were very co-operative and pleasant, and fortunately remained so throughout. Late on the day the serviceman was to call Shirl rang me to say that the technician had left, having replaced the entire coax from aerial to set. She was uncertain whether any other work had been done, but was sure that the back of the set had not been removed!

This disturbed me somewhat, as I felt that I could hardly ask neighbours to do any more. I tried to contact the Radio Inspector, only to find that he was recuperating from a fall through someone's ceiling, and was unlikely to return to work before a two-week Christmas break. Understandably the neighbours were keen to try the set again, so with a little trepidation I ventured into their home after work, armed with every TVI supression device which I could lay hands on. The first test confirmed my worst fears: total picture blackout, all channels, all HF bands —and the comment from Shirl that *"The picture is not as good as before!"* Investigation revealed that the clamp in the coaxial plug was not in contact with the braid; use of an attenuator fixed the picture's quality. But no combination of filters etc significantly reduced the TVI and in fact it was worse than when I had initially connected the set directly to the old coax. I cleaned the pre-set potentiometers and then began to check the earthing. The power point's earth was found in order but the set's round flex with a three-pin plug had only two cores and no earth. Relieved to find what appeared to be a significant fault, I decided to return the next day — I was worn out, having spent three frustrating hours running in and out of both houses to key my transmitter, using a rubber band on the paddle key!

My technical expertise has included servicing audio electronics for the last seven years but my experience with television was limited to pre-colour days. Most technicians would agree that the best recipe for disaster is to repair a friend's equipment in his home as a favour, especially when he is watching. The reasons are similar to those that doctors resist treating their families.

I connected a three-core flex and Shirl's calmness is to be praised when the big bang preceded the puff of smoke as I turned the set on. Immediately realising what had occurred I tried to emulate her calmness and contain my frustration. Much embarrassed, I even entertained the idea of trading my amateur radio for a new TV for my neighbours. Recovering my senses, I despaired when I saw the TV's main fuse had previously been bridged. I removed the printed circuit board with the remnants of the mains rectifier and sought the solace of my workshop, where I repaired it.

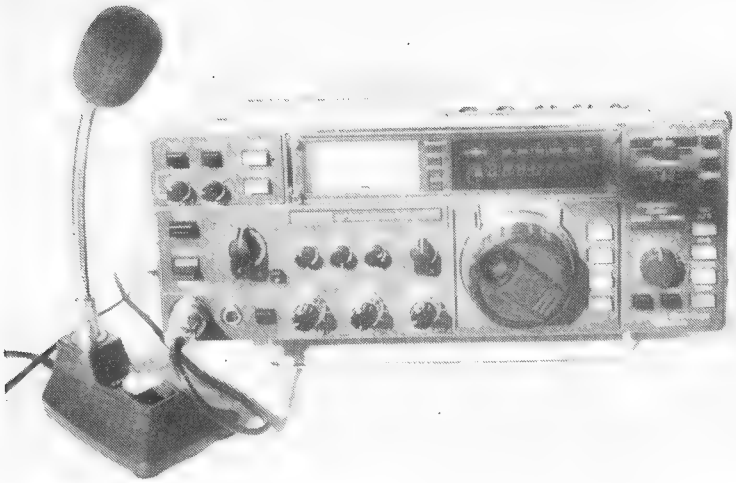
An hour later I returned, wondering if Shirl would still welcome my aid. She did and I re-installed the power supply. I have done major work on equipment many times the value of this set, yet never before have I been so nervous turning something on. The feeling of relief when the set sprang to life was immense. At least I was safely back to square one!

By now I had also armed myself with some .01 μF 1000 V capacitors and I earthed the braid through one for safety. Experimenting now with combinations of filters, I easily eliminated the TVI. While my neighbour was obviously pleased that the TVI was cured she was a little concerned as she now told me that their TV service contract forbade anyone tampering with the television. This failed to dampen my enthusiasm and I explained what I had done would not affect the set's function. The Radio Inspector subsequently confirmed this for her.

The following Monday morning I was greeted by the Radio Inspector when I arrived at work. He apologised for his absence and enquired how things had gone? He sat down as I told my tale and then he asked if the set was a German one with handles on the sides, as he now remembered being warned about them. On my affirmative he was most sympathetic, and kindly rang Ray and Shirl and advised them that they had been very fortunate and explained why.

No doubt I am better off for the experience, but it is one I could well have done without. I hope this article may help others to cope with a similar problem with somewhat less trauma!

AR



EQUIPMENT REVIEW

ICOM IC-745 HF, GENERAL COVERAGE RECEIVE TRANSCEIVER

It's surprising that Icom have somewhat played down the IC-745. Looking back through past issues of AR, I found that the last and only feature advertisement for the 745 was in the October 1983 issue. Advertisements for the IC-751, the higher priced model have appeared with much greater regularity. I can only wonder why.

I guess at this point many readers will be thumbing through their past issues to turn up that advertisement for the IC-745 to see just what it is all about and indeed it might be a good idea to have it on hand as you read this review.

My interest in the 745 was sparked when I noted that they were available "on special" at a most attractive price. I really believe that in the past, they were somewhat overpriced. Reference to American amateur magazines showed that over there they were selling in much the same price bracket as the TS-430 and FT-757 GX. The current price now puts the IC-745 at a definite advantage over many of its competitors. I of course leave it up to you to decide the issue

Well just what is the IC-745 and what does it have to offer? A quick answer would be to say that it is a general coverage receiver version of the now superseded IC-740. While hunting through your back issues of AR, look out the December 1982 issue in which we reviewed the 740. In appearance the 740 and 745 are identical except for one small point. The mode switch to the left of the "S" meter has been replaced with two push buttons on the 745. As we shall later see, several other controls now have quite different functions on the 745 as compared to the 740

But back to the 745 and see what it has to offer. The receiver is now a full general coverage all mode system. There is a low frequency cut-off at about 100 kHz and four tuning rates of 10 and 50 Hz, 1 kHz and 1 MHz to take you up to 30 MHz. Modes provided as standard are AM, USB, LSB, CW and RTTY with FM as an optional extra. All of these are also available on the transmit side with the exception of AM. Two VFOs are built in and these can be set up on different bands and different modes if needed. Sixteen memories can be entered along with any required mode and instantly recalled. All the memories are tunable, that is, when selected you can tune up or down from that frequency by any required amount but with the original memory frequency still available at the flick of the memory switch. A lithium battery provides power for an estimated several years of memory retention. All of the other 740 operating aids are retained on the 745. These include IF shift or bandpass, tuning (selectable), a notch filter operating at the 9 MHz IF frequency, off-set tuning for receive, transmit or both, noise blanker with switchable width and variable level, continuously variable AGC decay time, RF speech processor, all mode squelch control, comprehensive metering, VOX with front panel controls and an optional electronic CW keyer. There is also provision for a self contained AC power supply to be fitted thus making the 745 an extremely compact portable transceiver.

Overall dimensions are 111 mm high, 280 mm wide and 355 mm deep. Weight is 8 kg or with the built-in power supply 11 kg.

THE IC-745 ON THE AIR

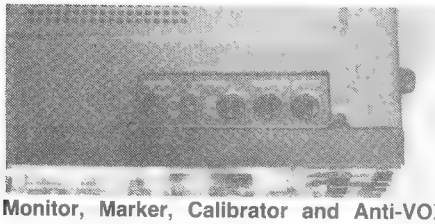
Depending on the type of transceiver you have been used to operating, you may find the 745 rather different in many respects. However as is often the case, it takes longer to explain the operation side of a new transceiver than it actually does to do things. Let's start out with band selection. There is no band switch on the 745. First it is necessary to decide if amateur band or general coverage operation is required. A push button beside the "S" meter allows the choice. With general coverage selected an LED indicator between the meter and frequency display comes on, then one MHz steps are selected with the main tuning knob after the "Band" button is pushed. With amateur operation selected the same procedure takes place except that the various amateur bands are stepped through either up or down in order of frequency. This can be carried out using either VFO A or B, so that it is possible to have an amateur band using USB on VFO A and the local broadcast station using AM mode on VFO B.

Now if you need to retain any of these frequencies in memory, just set the memory switch to the required position and push the "MW" (memory write) button and you have that frequency and its associated mode there for future recall. In my case, I set up four local BC stations, six at the edge of some popular short wave broadcast bands, five of my usual amateur band frequencies and the last on the low frequency airport terminal information channel of our local airstrip. All very handy.

With all that we haven't even got to the transmit side yet. But with all the fun of tuning around, it took some time to even think about transmitting. However just one point before we do. For reception below 1600 kHz a separate antenna input is provided. From here down, overall sensitivity seemed to be very low and a wire antenna of at least 10 to 15 metres was needed to bring in the local BC stations at reasonable strength. There is a happy side to the story though which is that cross modulation is quite low. The receiver preamp does not operate below 1600 kHz.

Now to the transmit side of the 745. I used an Icom PS-15 power supply for all tests. Set up on my usual 20 m frequency, I pushed the mike button and spoke. The result, no output. After a good deal of pushing, pulling and checking, I found the problem. Although tuned to an amateur band, I had the general coverage mode selected and all transmit function is inhibited.

A quick stab of the HAM/GEN button put things right. As the 745 is of course a fully solid state transceiver no tune up or loading is required. Just push the right button, set the mic gain and you are in business. While transmitting it would be usual to monitor the ALC on the meter with drive controlled by means of the mic-gain control. This is where a slight "funny" comes in. If you decide to use the compression, the mic-gain becomes the compression control and there is then no way to run at a lower ALC setting except by reducing the compression. Having said that, the audio reports were good, but for some reason the audio quality changed when the compressor was in use. The best quality reports were received when the compressor was in use with about 5 dB of compression. I remember a similar effect with the IC-740 where the transmit audio sounded cleaner with the compressor on. In our tests an HM-12 hand microphone and a SM-6 desk microphone were used. Most



Monitor, Marker, Calibrator and Anti-VOX controls on top of the unit.

contacts preferred the SM-6 but it lacked the up/down scanning facility of the hand microphone. Pity Icom do not have a scanning desk mic.

As I mentioned earlier, some of the controls on the 745 are "different". Perhaps the most different of them all is the mode selector. This works on the sequential method. Push the button once and next mode along is selected. The modes in order are LSB, USB, CW, RTTY, AM and FM. The selection goes in one direction only, so if you want to change from USB to LSB it takes five stabs of the button. This itself is not as bad as it sounds but when going between USB and CW and then to RTTY there is a rather loud plop from the speaker. If you like to use a good quality speaker system, as I do, then you will hear the plop in super hi-fi. One point of criticism I had with the 740 was that the slow AGC position was not slow enough. The full slow setting now has a decay time of about ten seconds from S9+10 dB which is ideal for those strong 80 metre nets. Of course you can have it as fast as you want — just turn the knob.

The IF shift and band pass tuning work in the same manner as the 740. Again it's a pity they cannot both be used at the same time. With the control centred, I found the quality on SSB a little toppy. Things sounded better with a slight offset for LSB one way and USB the other. Either the IF shift or the PBT were useful in reducing the effects of interference. I could not actually find a situation where one was better than the other on SSB however the PBT was effective for CW reception.

While on the subject of CW, Icom have a selection of filters that should please the most ardent CW operator. CW operation is via the VOX system. Unfortunately the initial make and final break as the VOX keys causes a loud plop in the speaker, the actual keying in between is very quiet. Side tone is around 600 Hz and sounds very clean, the level being adjustable with the normal audio gain control

A notable improvement on the 745 is the operation of the cooling fan. This is now thermostatically controlled and only comes on when the final heat sink reaches a preset temperature. In practise this only occurs after several minutes operating in the SSB or CW modes. Quite an improvement over the 740 where the fan was actuated as soon as the transmitter was keyed. Fan noise was a reasonable level.

THE IC-745 TUNING, MEMORY AND SCANNING SYSTEM

These facilities are so comprehensive that a full description is needed. Tuning is really in four speeds, slow turning of the tuning knob gives a tuning rate of two kHz per knob revolution. If the knob is turned at a rate exceeding about one revolution a second this steps up to about 10 kHz per revolution. The TS button produces 1 kHz steps or 200 kHz per knob revolution and finally the band button increases the stepping rate to 1 MHz or the next amateur band depending whether Ham or General operation is chosen. The normal tuning rates are perhaps not ideal. The old 740 had a 100 Hz selectable step which was usable for most operation and did not require fast turning of the knob. It seems that Icom ran out of positions to place a changeover push button, so we have to settle for a compromise which makes fast band scanning to check for activity a difficult exercise. My solution would be to substitute 100 Hz tuning rate for the 1 kHz rate which is not usable for normal tuning.

We have already touched on the memory system of the 745. To supplement this is a scanning system for the memories and also a selectable band scan.

The memory scan will scan only those memories that have a frequency entered into them, it will skip any vacant channels. In order to have the scan pause on a channel it is necessary to set the squelch control to provide a threshold. Unfortunately this doesn't work very well, particularly if the signals you want to monitor have widely varying signal strengths. If you set the squelch to suit the signal, the scan will pause for about six seconds (adjustable).

The programmable band scan operates when the first two memory positions are within the same amateur band, then by selecting one of the VFO positions, the set will scan between the two frequencies. Again the system is not entirely satisfactory. The scan speed is too fast and although this is adjustable, cannot be adjusted slow enough to be able to identify an SSB signal as it tunes through. The two adjustments mentioned above are internal and not readily accessible. Finally in this section mention must be made of the noise blanker. As I recall the blanker in the 740 was not operating at all. But the 745 blanker certainly was. Let's look at the effect on the Woodpecker first. It took some time to discover that for the blanker to be effective, it was necessary to speed up the AGC decay time. With very slow AGC selected, the blanker just cannot reduce the gain quickly enough to suppress the Woodpecker pulse. Perhaps Icom might like to mention this in their instruction manual.

Of course the "wide" mode must be selected for Woodpecker blanking. Ignition and general electrical noise is mostly taken care of using the normal blanker mode. At any setting, the blanker causes very little cross modulation, but in the wide mode with full level there is quite a bit of signal chopping, however this is a small price to pay for relief from the various noises that plague us.

THE IC-745 ON TEST

The following equipment was used to produce our figures on the IC-745: Drake W4 watt-meter, Yaesu YP-150 watt-meter dummy load, Kenwood SM 220 monitor scope, Daven audio power meter, AWA F242A noise and distortion meter and a 100 kHz crystal calibrator.

Frequency stability was checked by running the receiver against VNG on the three frequencies audible. Stability was of a high order. In fact it was so good that it proved hard to measure. I can only estimate that total drift did not exceed 25 Hz under any conditions tried.

Power Output. Power was measured with full carrier in the RTTY mode and then checked for PEP output and linearity using the monitor scope —

1.8 MHz 95 watts	18.0 MHz 80 watts
3.5 MHz 95 watts.	21.0 MHz 75 watts
7.0 MHz 90 watts.	24.5 MHz 75 watts
10.0 MHz 87 watts.	28.0 MHz 70 watts.
14.0 MHz 85 watts	

PEP output was much the same with a very clean scope pattern both on speech and on two tone test.

Receiver Tests. With the audio gain at zero, residual noise measured -47 dBm unweighted. This is marginal, and hiss is audible when using headphones or a forward facing external speaker.

The crystal calibrator was fed into the receiver, set for a 1 kHz beat note and the distortion measured. At two watts output distortion was 1.8%. These tests show that the audio performance of the 745 is very similar to the older 740. The action of the tone control has been improved over the 740. At full setting, the output at 2.5 kHz was reduced by 20 dB but the output at 1 kHz was reduced by only 4 dB. This is a good result. The notch filter was checked at several points across the audio band pass. The specification rates it 30 dB. I was able to meaure 25 dB. It should be remembered that the notch filter works at 9 MHz in the IF strip and will actually reduce the signal strength and not just the audio level as with an audio notch filter.

However the notch appeared to be rather wide and had a noticeable effect on both the recovered audio quality and audio level.

Receiver AGC was checked by feeding the crystal calibrator into the antenna input to produce an "S" meter reading (preamp off) of S2, S8 and S9+20 dB. The audio output level increased by 1, 2 and 4 dB at these points. This is a satisfactory result and a noticeable improvement over the IC-740.

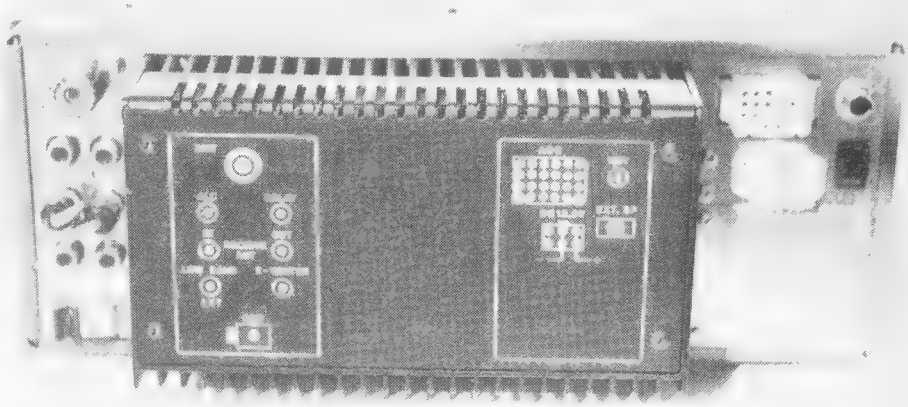
Sensitivity tests must remain comparative for the time being, but rated very well against my standard of comparison. The preamp certainly sparked up the overall gain by around two "S" points, but in no case would it make a weak signal any more readable. I thought that the S meter readings were fairly normal — again by comparison — with the preamp out of circuit. There were times however when I thought a front end attenuator would have been useful, but none is provided. The preamp does not operate below 1.6 MHz. A funny effect with the AGC was that strong broadcast signals sounded rather distorted with the AGC in the fast or medium position but cleaned up with the AGC set to full slow. The receiver sounded slightly fussed when local BC stations got up near full scale on the meter.

Instructions Book. Icom instruction books are in general well written and printed. In the case of the 745, it is up to that standard. However it is an instruction book and not much else. There is no circuit description or any information at all on the theory of operation. Several pages are devoted to the installation of the numerous options such as filters, FM unit, keyer and inbuilt AC power supply.

A full schematic diagram and block layout are included as is a page of operational trouble shooting. A full service manual is available as an option.

CONCLUSIONS

At the present selling price of around $1000, the 745 is excellent value. It offers a combination of facilities



Rear view of the Icom IC-745 transceiver.

not readily available in other transceivers in this price bracket. The 745 is also compatible with the full range of Icom accessory equipment such as the automatic band switching linear amplifier and antenna tuners

My thanks to Icom Australia for the loan of our review transceiver

EVALUATION AND ON AIR TEST OF THE ICOM IC-745

Serial No 26102187

Rating code. Poor * Satisfactory ** Very good * Excellent ****

APPEARANCE

Packaging
** *Strong carton. Foam inserts. Not quite up to other Icom models.*
Size
**** *Compact. If power supply built in super compact.*
Weight
*** *8 kg — only 11 kg with built in P/S.*
External Finish
*** *Very clean appearance.*
Construction Quality
**** *Typical Icom quality.*

FRONT PANEL

Location of controls
*** *Some concentric controls rather finicky, otherwise good.*
Size of knobs
** *I think we are getting used to smallish knobs.*
Labelling
*** *Clearly labelled.*
Meter
*** *Very clear & well illuminated.*
VFO knob
*** *Smooth action. See text for comments on tuning rates.*
Digital display
*** *Bright, accurate but needs 10 Hz display.*
Status indicators
** *Could use a few more.*

REAR PANEL

** *Many connections to 24 pin socket for which no plug is supplied.*

RECEIVER OPERATION

VFO stability
**** *Very stable. See test section.*
Digital dial accuracy
*** *Needs initial calibration but then spot on.*
Memories
*** *16 memories*
Scanning
* *Icom haven't quite worked this out as yet.*
Shift/width
** *Both provided but only one usable at a time*
Notch filter
** *Have seen better, but works OK.*
Spurious responses
*** *Only a very few at low level.*
"S" meter
*** *Smooth acting and realistic.*
AGC
**** *Continuously variable decay time gives excellent results.*
Signal handling
*** *Very free from cross mod. Only local BC stations cause concern*
Clarifier
** *Switchable for transmit or receive but no display of offset.*
RF attenuator
** *Preamp in/out works well, but could also use an attenuator.*
RF gain control
*** *Progressive and smooth action.*

NOISE BLANKER

Line noise
*** *Very good with most electrical noise.*
Ignition noise
**** *Cuts it dead.*
Woodpecker
** *Works at times, better than nothing.*

QUALITY OF RECEIVED AUDIO

Internal speaker
** *Reasonable quality.*
External speaker
NA *Available as option. Not tested.*
Headphone output
** *OK with stereo phones. Some hiss audible at low level.*
Tone control
*** *Very useful.*

TRANSMIT OPERATION

CW/PEP output
*** *See test section for results.*
Audio response
** *Generally good reports. Icom are not noted for smooth speech quality.*
Microphone gain
** *Plenty with preamp mic, just OK with hand mic.*
Transmit monitor
** *Sounded slightly distorted.*
ALC action
*** *No flat topping. Meter indication better than 740.*
Compressor
*** *Most effective. But quality change when in use.*
Relay noise
*** *Quite low.*
Metering
*** *Most wanted functions available.*
Cooling
*** *Thermostatic operation. Fairly quiet when working.*
Linear switching
**** *RCA jack for FL2100 type — or integrated switching for Icom Linear.*

MANUAL

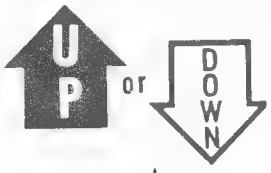
Operating instructions
*** *Covers most aspects.*
Theory of operation
* *Not a mention.*
Servicing information
* *Only operational problems.*

AR

SKYTRIM

A TOWER OF STRENGTH

CRANKS



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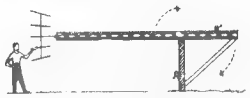

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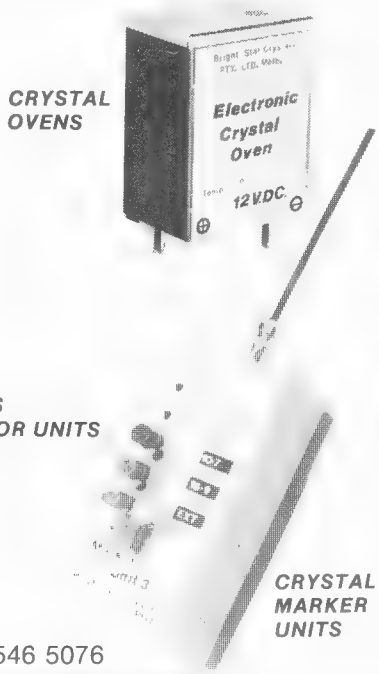

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EQUIPMENT REVIEW

Ron Fisher VK3OM,
3 Fairview Avenue, Glen Waverly, Vic. 3150

THE TRIO FUNCTION POWER METER PF-810

Regular readers of Amateur Radio have probably noted the advertisement from William Willis and Co featuring the Trio PF-810 Function Power Meter. I have often seen it and wondered just what the device really looked like and how it worked.

The PF-810 is a through line power meter with three forward ranges of 5, 25 and 150 watts full scale. These can be used to measure either forward power, reflected power or radiated power which is actually forward minus reflected power. A normal SWR scale is also provided. Input to the meter can be selected from two sources via a front panel selector. The meter is self contained and requires no external power source. Trio claim that this is a professional instrument of laboratory quality.

The instrument is well constructed and rather larger than expected. It measures 200 mm high including buffers, 127 mm wide and 140 mm deep including knobs and coax connectors.

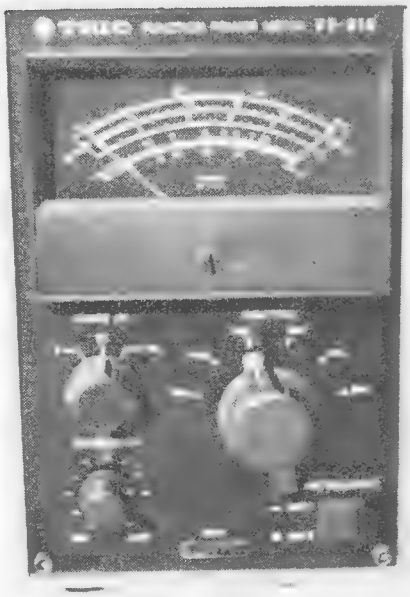
The PF-810 has a rated frequency range of 1.8 to 200 MHz and a minimum power for SWR measurement of 1 watt.

Connectors are of the SO-239 type which perhaps seems a strange choice for a laboratory quality instrument. 'N' type connectors could have been better especially at the higher frequencies.

THE PF-810 ON TEST

The following equipment was used to evaluate the PF-810. Marconi ZDA/0568 terminating watt meter. Drake W-4 HF through line watt meter. Heath Cantenna 50 ohm load and a Horwood VHF terminating watt meter.

SWR measurement sensitivity was measured on all amateur bands from 1.8 to 146 MHz. On the lower bands a minimum power of 0.8 of a watt was needed going down to 0.6 watt on 28 MHz and above. SWR reading was checked by firstly feeding power through the PF-810 to a 50 ohm load. The meter indicated 1.1 to 1. That is just above a zero reading. Next two 50 ohm loads were connected in parallel. The PF-810 read exactly 2 to 1.



Power readings were compared with both terminating watt meters and also the through line meter terminated in 50 ohms. Full scale readings on the 810 were within 1% of the comparison meters. Half scale readings on the 810 were within 5% of the comparison meters.

I was unable to verify the rated insertion loss of less than 1.0 dB up to 200 MHz but it appeared that the specification would be conservative.

THE PF-810 CONCLUSIONS

Within its specifications, the PF-810 performed in a flawless manner. It's a pity that a 1500 watt range is not included as this would widen the appeal of this excellent instrument.

The instruction booklet is well written and contains all information needed to get the full results from the meter. A schematic diagram and Smith chart are included.

The TRIO Function Power Meter, PF-810 serial 4040187 used in our review was supplied by William Willis and Co Pty Ltd of 98 Canterbury Road, Canterbury, Victoria to whom all inquiries should be directed.

AR

PHILIPS TMC DIVISION HOSTS NINE PERSON DELEGATION

Philips TMC, Clayton, Victoria (The Radio Communications Division of Philips Industries Holdings Ltd) recently hosted a nine member delegation from The People's Republic of China.

The delegation is comprised of commercial representatives from the China Electronics Import and Export Corporation (CEIEC) and technical experts from the Nanjing Radio Factory.

They are in Australia inspecting the design and production capabilities of Philips TMC, in particular the FM95 series of mobile automatic telephone systems (MATS) with the end view of local manufacture in The People's Republic of China.

A special get-together was held at the Noah's motel on Monday 25th June, which was attended by the WIA President Dr D Wardlaw VK3ADW.

AR

EQUIPMENT REVIEW

Ron Fisher VK3OM,
3 Fairview Avenue, Glen Waverley, Vic. 3150

THE KENWOOD AT-250 AUTOMATIC ANTENNA TUNER

The Kenwood AT-250 antenna tuner is designed as a matching accessory for the TS-430/43X but also directly useable with the TS-930 not equipped with an antenna tuner and also the TS-130 series. Automatic band switching of the AT-250 is provided when connected to the 430/43X but not with the other transceivers, although the automatic antenna tuning feature still operates with the other rigs. The AT-250 is useable with any make or model of transceiver that can provide a switching output from its send/receive relay.

The term antenna tuner will no doubt mean many things to many people. But let's put things straight right from the start, the AT-250 is not an antenna tuner. It is better described as a transmission line impedance matcher for use in a mis-matched 50 ohm unbalanced feeder.

The need for a matcher of this type seems to have arrived for a variety of reasons, the first being the solid state broad band final transceiver which requires a 50 ohm load to produce maximum output. Perhaps another reason is the wide spread use of narrow band width tri-band beams and other such antennas. The decision if you need one or not, is up to you, however the AT-250 does have other uses. Read on.

THE AT-250 TECHNICAL DESCRIPTION.

As mentioned above, the AT-250 matches the 430/43X series of transceivers in both size, styling and colour. Overall dimensions are 174mm wide, 96mm high and 257mm deep. Weight is 4.2kg. The unit is most attractively designed.

The antenna tuner section is a relay band switched pi net-work with two motor driven tuning capacitors. The relay band switching is controlled either with information from the 430/43X transceiver or from a manual band switch on the front panel. Two SWR through line sensing networks provide information for the built in power/SWR metering and for the motor driven antenna tuner. The circuitry is quite complex with a total of 13 IC's, 31 transistors, 2 FETs and 77 diodes. The unit has its own built in AC power supply.

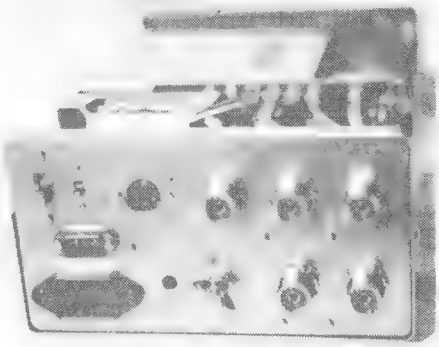
The power/SWR meter is a very nice piece of work. Two power ranges of 20 and 200 watts RMS or PEP plus an automatic no set required SWR meter, make a very versatile unit. Manual switching of four antenna inputs adds to the versatility. Connecting cables are supplied for operation with the 430/43X, the TS-130 or other transceivers.

THE AT-250 IN USE.

Kenwood were kind enough to supply a new TS-43X so that we could check out the 250 in all respects.

For a test set up, I used a trap vertical antenna which has a fairly narrow band width and a rising SWR either side of resonance, perhaps a typical antenna that the AT-250 would be required to straighten out. However firstly I checked out the power/SWR meter. The system requires about 5 watts of forward power to produce an actual SWR reading and from there up, the SWR reading is entirely automatic. Power was checked against my standard power meter and found to be just 10 per cent high at both 30 and 100 watts (both on the 200 watt scale) and the same percentage at 10 watts on the 20 watt scale. The PEP feature of the meter is most useful. The ballistics of the meter circuit are such that quite accurate readings can be taken on normal speech SSB input. For accurate measurement of the 30 watt novice power level, the meter should peak at about the 20 watt mark.

The trap antenna resonates at 3.6 MHz with the SWR rising rapidly either side. At 3.640 MHz it is up to 2.5 to 1. As with the SWR meter, the auto mechanism requires about 5 to 10 watts of continuous transmitter output to operate. With the 'Tune' button depressed, the motors whir, the SWR meter swings wildly and finally settles at 1.1 to 1. On the 80 metre band I was able to correct for an SWR of about 5 to 1. Of course this does not imply that the antenna is working at anything like peak efficiency. In fact at this point the radiated signal had dropped by around three S points (relative report received) but the transmitter was happily supplying 100 watts to the line.



Rear view.

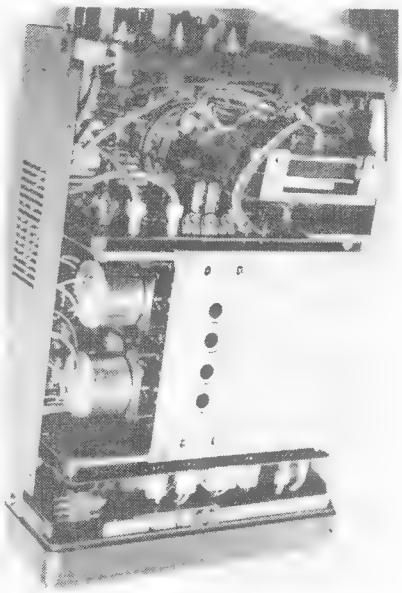
Loss through the tuner was measured at 10 per cent. This appeared to remain fairly constant regardless of the mis-match being corrected.

A switch at the rear of the unit allows the tuner to be switched out for receive only operation. Several tests did not show up any detectable difference on receive with the tuner in or out of circuit.

INSTRUCTION BOOK.

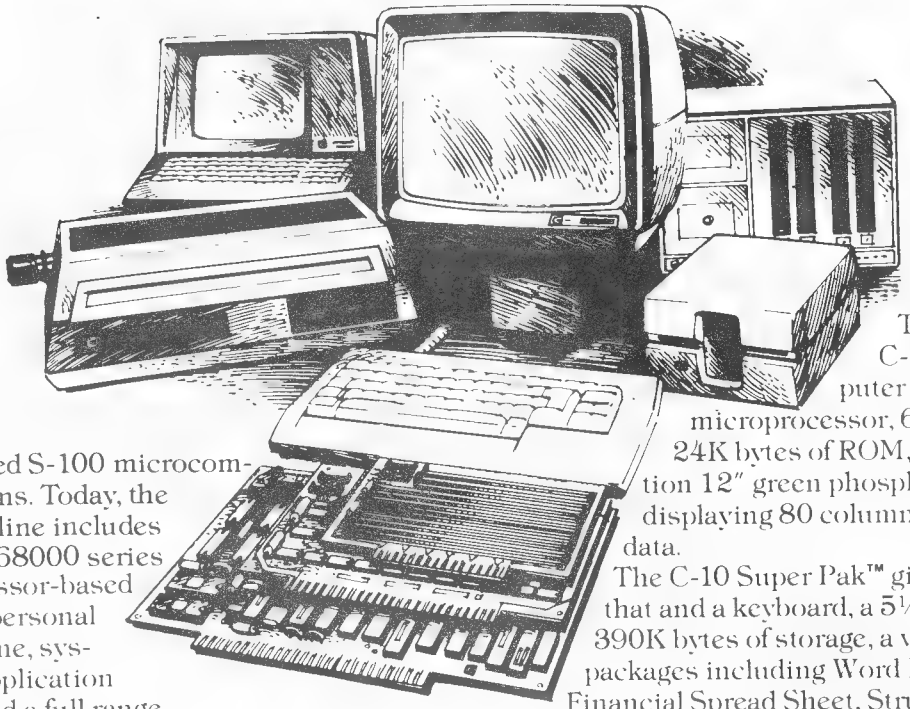
The instruction book is actually a fold out sheet. It contains full operating and connecting instructions, including details on using the AT-250 with transceivers other than the 430/43X. A full circuit diagram is included. All the information is clearly explained, but the specifications refer to the meter switch 100W and 10W positions which of course should be 200 and 20 watt positions.

Thanks to Kenwood Australia for the loan of the AT-250 and the matching TS-43X transceiver. Details of price and availability should be directed to them or one of their local agents.



Internal view.

Cromemco® has it all from build-ins to hands-on. And Insystems has all of *Cromemco*®



Since 1975, Cromemco has been an industry pioneer in advanced, sophisticated S-100 microcomputer systems. Today, the Cromemco line includes Z-80A and 68000 series microprocessor-based systems, a personal computer line, systems and application software, and a full range of board-level products. And Insystems carries them all.

This wide range of systems, software, and components lets you choose the hardware/software combination best suited for you. Consider their board-level products, for instance.

Cromemco offers a wide variety of board-level system components, including CPUs, memory cards, graphics and I/O cards. These boards are fully integrated with each other and with Cromemco systems to assure reliability. With these S-100 bus cards, systems can be easily configured for specific applications in almost any professional, industrial, or business field.

In addition, Cromemco offers a complete line of support system components, such as card cages, power supplies, extender cards, and system connector cables for individual or OEM system requirements.

A good reason to buy a personal computer.

The Cromemco C-10 personal computer includes a Z-80A microprocessor, 64K bytes of RAM, 24K bytes of ROM, and a high resolution 12″ green phosphor CRT, capable of displaying 80 columns and 25 lines of data.

The C-10 Super Pak™ gives you all that and a keyboard, a 5¼″ disk drive with 390K bytes of storage, a variety of software packages including Word Processing, a Financial Spread Sheet, Structured BASIC, Investment Planning, and the CDOS operating system.

Cost? Surprisingly low. Even Cromemco multi-use systems, which support CROMIX and UNIX, and main frame based, high-level languages, are priced well below competing alternatives.

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BOOK REVIEW

Fred Robertson-Mudie VK1MM
Federal RTTY Co-ordinator

RTTY TODAY

Whilst most of the RTTY books available go into great technical detail on teleprinters, modulators, demodulators, filters etc, there is rarely much information available on using a home computer for RTTY operation. This book, however, concentrates on the use of the computer for RTTY and could, therefore, be seen as the missing section from all the other RTTY books.

It may be seen by some of the 'purists' as a black box operators guide to RTTY in that it is virtually devoid of theory or technical detail and concentrates on the basics of using a computer to generate RTTY, ASCII, CW and, to a lesser degree, AMTOR. However, it serves the very useful purpose of illustrating just how easy it is for an amateur to get into RTTY and may even encourage some of the computer buffs to get involved in amateur radio.

The book discusses various readily available home computers, such as the VIC 20, Commodore 64, TRS 80 etc, their general structure and selection. This is followed by some basic circuits for building your own modulator and demodulator, and a circuit for a loop supply for those who wish to utilise a teleprinter as a printer for their computer. Discussion then turns to the various types of software packages on the market, from plug-in ROM boards to cassettes, floppy discs, and some of the commercial modems/interfaces computer patches to connect the computer to a transceiver. Included in this is some data on the combined hardware software plug-in modules, such as the Microlog AIR-1 which, in combination with a VIC 20, is all that is needed to get up and running on RTTY – plus a transceiver of course. Interspersed with the above information are a number of illustrations on how to hook up the computer equipment to a transceiver.

The author then goes on to cover some of the dedicated RTTY terminals available, such as the Hal terminals and the Telereader – with the surprising omission of the Tono Theta – and the assorted mini-systems and mini-readers on the market.

Finally, there is a chapter of miscellaneous information which includes the American amateur bands and RTTY segments, some fixed service RTTY and Sitor frequencies, four pages of Press Service frequencies and Oscilloscope tuning patterns.

In summary, the book is basically a users guide to commercially available computer and associated equipment for RTTY, ASCII, CW and AMTOR operation (though, surprisingly, it does not mention Packet Radio). It should be a useful addition to existing texts and could well encourage both amateurs and SWL's to take the easy way into the interesting world of RTTY.

RTTY Today is available from your division or from Magpubs, PO Box 300, South Caulfield, Vic 3162. Price is $8.95 plus postage for members of WIA.

AR

MAGAZINE REVIEW

Roy Hartkopf, VK3AOH
34 Toolangi Road, Alphington, Vic 3078

(G) General. (C) Constructional. (P) Practical without detailed constructional information. (T) Theoretical. (N) Of particular interest to the Novice.

SHORT WAVE MAGAZINE March 1984. Mini two band receiver. (C,N) Trapped antennas. (C)
CQ April 1984. Special Antenna Issue. (G)
ORBIT January 1984. General Amateur Space news.
RADIO COMMUNICATION June 1984. HF Transceiver. (P)
WORLDRADIO May 1984. General world amateur news. Reducing TVI and RFI. (G) Courage Handi-Ham — Help and equipment for disabled amateurs (G)
73 MAGAZINE June 1984. Simple 500 MHz Frequency Counter. (C) Digital Voltmeter. (C) Rate your Club. (G)
HAM RADIO May 1984. Annual Antenna Issue. Theory and Practical information on antennas, matching etc.
QST April 1984. High power two metre amplifier. (C) Digital frequency synthesizer. (P) QRP, DX News. (G)
HAM RADIO April 1984. Resonant Circuits. (G.N) Graphic Filter design. (T) Branch line hybrid. (T)
CQ May 1984. 1983 World Wide contest. (G) Practical function generator. (C) Simple noise bridge. (C.N)
73 Magazine July 1984. Cordless phones. (G) International news. (G) LM3914 LED readout. (P) Perforated circuit board. (P.N)
WHAT'S NEW IN ELECTRONICS. June 1984. Australian trade magazine listing new equipment, components etc.

AR

UPDATE TO "CHESS ON THE AIR" NETS

Further to our "Chess on the Air" article last month, there has been a revision of the net schedules published.

New information is as follows

DAY (UTC)	TIME (UTC)	FREQUENCY (MHz)
Tuesday	0930	3.567
Tuesday	1000	145.575 (Melbourne only)
Saturday	0430	14.267
Sunday	0430	14.267

EXPLORING THE WEST WITH TWENTY METRES.

Keith Scott VK3SS,
34 Henry Street, Maffra, Vic 3860.

Some months ago our worthy editor requested an account of some travelling and I agreed, so my conscience (flexible variety) will not let me procrastinate any longer.

After much planning a group of eight four-wheel drive vehicles, members of the Range Rover Club, met at Alice Springs in mid-August 1983.

With the vehicles overladen with supplies we headed west from Alice Springs to Glen Helen on the banks of the Finck River, through the aboriginal community at Papunya and then into the Great Sandy Desert, over the WA border and past Sandy Blight Junction. The track thereafter deteriorated progressively for several hundred kilometres.

There is no human life in this area due to lack of water but one occasionally sees camels and plenty of small creatures, lizards, geckos and some nocturnal animals. The desert is mainly flat with small outcrops of rocks and occasional hills. Most of the area is covered with endless round clumps of prickly spinifex which is highly inflammable as it is full of resin.

Each day we stopped at around 0245 UTC for lunch and to check into the Travellers Net on 14.106 MHz at 0300 UTC. Using mobile equipment with a helical antenna we had no problems contacting the control stations — VK's 6ART, 6KC and 3YK. This net is a great safety cover besides exchanging experiences with other mobile stations throughout Australia.

Most evenings contact was made home via VK3DY and other regulars VK's 3XD, 3ZF, 3QH and 3BSM. Lottery numbers and football scores were eagerly sought by other members of the group. Amateur radio adds considerably to the joys of outback travel.

We headed steadily west until reaching the Canning Stock Route and then headed north across some formidable sand dunes to the eighty year old Well 37, which is one of the few remaining wells holding drinkable water. Finally the WA coast was reached and then after some back-tracking and zig-zagging we headed to Broome, Derby and along the Gibb River.

Next it was northward again to the aboriginal country at Kalumbarra, west to King Edward River and north to the Mitchell Plateau and Port Warrender in the Admiralty Gulf.

From Port Warrender we back-tracked down the Gibb River track to Wyndham for a quick eyeball contact with VK6GU then onward south to Halls Creek. Here we noted a large dish antenna, about 7.5 metres in diameter, tilted at a fixed angle. This antenna picks up ABC television programmes from a satellite in fixed orbit, transfers the signal to another antenna on a nearby mast, which repeats the programme for local reception.

Next we visited the Wolf meteor crater, said to be the second largest in the world, onto the Tanami Desert and then south-east to Alice Springs, via Rabbit Flat. From the Alice a leisurely trip was taken around the edges of the Simpson Desert, through the Flinders Ranges, Broken Hill, Mildura and back to Gippsland.

AR

DUAL CPU-CONTROLLED 2-METRE FM HANDIE TRANSCEIVER

From Yaesu, the folks who originated the synthesised amateur handheld transceiver comes the finest product of its kind ever to emerge, the FT-209R. Blending the suggestions of FT-207R and FT-208R operators with the latest advances in microprocessor design and microminiature manufacturing, the FT-209R offers the operator a wealth of features far beyond anything yet conceived, in a package much smaller and lighter than any other CPU-controlled transceiver.

The FT-209R provides 3.5 W RF output (or 5 W from the RH version) in the high power mode, and operates in user-selectable full or half channel steps across the 2 m amateur band. Twenty dual-function keys on the front panel give the operator thirty nine different commands for programming the two 4-bit microprocessors at the heart of the FT-209R. Each of ten memory channels allows the operator to store independent transmit and receive frequencies, for any repeater shift in any channel, with touch-key reverse or simplex on either frequency.

The manual or auto-stop scanning capabilities include step-programmable full or partial band or memory bank scanning for clear or busy; skip or select channel exclusive scanning; calling channel, select memory or dial priority scanning/monitoring, and other unique yet useful functions too numerous to list, but all programmable from the front panel keypad. Yet even with all of these functions, operation remains simple: the CPUs do the work for you, keeping the number of keystrokes to a minimum.

Operational battery charge life can be greatly extended over standard squelched reception when monitoring, with Yaesu's programmable Power Saver System, which only activates the receiver to check the selected channel momentarily at programmable intervals.

A front panel multimeter indicates either battery condition or received signal strength and relative transmitter output power, with a side panel lamp button for easy viewing in the dark. The fat ¼-inch high frequency digits on the LCD are complemented by ten memory channel indicators and nine other special function indicators, so the operator knows the exact status of all transceiver functions at a glance.

When the optional FTS-6 Tone Squelch Unit is installed (model A only), any of thirty seven CTCSS tones may be selected from the keypad and stored in the memories, with the particular tone stored in each channel indicated on the display along with the stored frequency and memory channel number. The state of the Tone Squelch (encode only, encode/decode or off) may also be programmed and stored in each channel. A DTMF encoder is included as standard in model A, while a 1750 Hz burst tone generator is included in models B, C and E.

The top panel includes a high/low power select switch and VOX on/off and level select switches (for completely hands-free VOX operation with the optional YH-2 Headset). Other options include the FNB-3 (425 mAh) and FNB-4 (500 mAh) slide-on Ni-Cd battery packs, FBA-5 battery holder (for 6 AA-size dry cells), NC-15 Quick Charger/Adapter, NC-9B/C (for FNB-3) and NC-18B/C (for FNB-4) Compact Chargers, PA-3 Mobile Adapter/Trickle Charger, MH-12A2B Speaker/Mic, and MMB-21 Mobile Hanger.

For further information contact Bail Electronic Services, 38 Faithful Street, Wangaratta, Vic. 3677.

AR

PHONE PATCH UNIT

After three years of planning and development Australia's only phone-patch unit specifically designed for radio amateurs and CB operators is now available.

Marketing manager of TARA Systems, Neil Parkinson said it was the latest model in a range of TARA radio/telephone interconnect units in use throughout Australia by emergency services, government agencies, and business enterprises.

He said *"Considerable research and on-air testing of prototypes since 1981 had resulted in a versatile unit called TARAPATCH.*

AR SHOWCASE

"It's not only a phone-patch but can be used as an interface between up to three different base radio sets.

"This enables the user to engage in cross-band operations at the flick of a switch, or provides an easy way to record all communications by plugging in a cheap cassette recorder."

Mr Parkinson said the record facility could also be used to pre-record a message in cases when a phone-patch party was either not on air or answering the telephone.

TARAPATCH is housed in a low profile case with all controls mounted on a sloped front panel providing ease of operation.

An in-built speaker provides a monitor of both the radio and telephone conversations, and can also be used as a microphone giving an ability to readily speak to either party.

Mr Parkinson said: *"While the basic unit will do everything normally expected of a phone-patch for radio amateurs and CB operators, it is adaptable to suit individual special requirements.*

"One important feature is the user has full supervision over communications passing through TARAPATCH and is able to intervene or join the patched conversation."

TARAPATCH comes with 1.6 metre cord and Telecom type 604 plug, and requires 12V DC power.

Connection for up to three HF, VHF, or UHF radio sets is via rear mounted 5 pin Din sockets.

The only external adjustment, a slider volume control, adjusts output from the monitor speaker.

All to and from radio signal levels are internally preset but can be adjusted to suit individual needs.

For further information contact: Neil Parkinson, phone (03) 729 0118.

AR

TELESCOPIC ⅝ WAVE WHIP

A collapsible ⅝ wave antenna designed for use on 2 metre Handy Talkies or portable transceivers is now available.

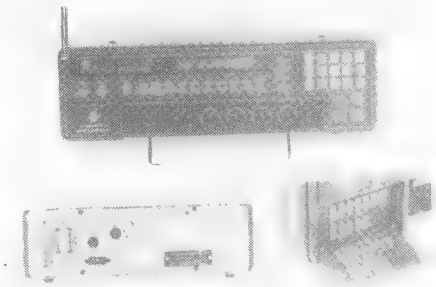
Known as the Vocom model G-58 it provides approximately 10 dB gain over a typical rubber duck antenna when extended. Even when collapsed to its minimum height of 20.5 cms it will usually exhibit performance better than the average rubber duck type antenna.

The G-58 is able to provide its performance by utilizing a highly efficient matching network at its base. This network uses an inductance which is tapped separately for both the 50 ohm input and its feed to the telescopic radiator. In order to present a purely resistive 50 ohm load to the transeiver the G-58 also incorporates a small amount of capacitance within the matching network. The connection at its base is a male BNC type.

The matching networks coil is manufactured from spring steel and therefore doubles as a spring which protects both the transceiver and antenna in such case that the antenna be hit.

Price of the Vocom G-58 is $45.00 plus $5.00 P&P. For further details contact GFS Electronic Imports, 17 McKeon Road, Mitcham, Victoria, 3132 or PO Box 97. Phone: 873 3777.

AR



NOT TO HANDLE SX-400 SCANNER

GFS Electronic Imports first announced in 1982 that a new, very broad frequency coverage programmable scanning receiver, the SX-400 would become available during that year. This scanner was to cover from 26 to 3.7GHz with external interface facilities for use in conjunction with a computer.

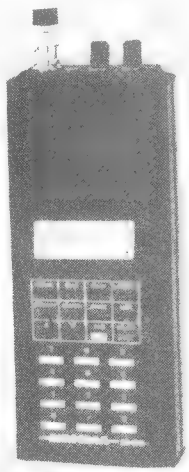
Consequently the SX-400 didn't arrive during 1982, or even during 1983. Nissan Densai Co Ltd the manufacturer was not able to offer its dealers production stock until the autumn of 1984.

When the unit did finally become available it suffered from a number of serious drawbacks which put it a long way short of meeting its originally published specifications. For example many spurious signals existed within its operating range 26 to 520 MHz. These were particularly bad from 26 to 74 MHz with a 1 to 2 MHz wide band of birdies between 70 to 74 MHz, some up to 40dB above the noise. The SX-400's UHF Sensitivity was much worse than the 1uV for 12dB shown in its published specifications. It exhibited very poor image rejection particularly on UHF because of the inherent design which uses a10.7 MHz first IF.

None of the advertised accessories had been made available and no definite delivery advice was forthcoming. This meant that the SX-400 would not operate above 520 MHz or below 26 MHz until its various converters came to fruitition and even then the converters that were on the drawing board provided only 10 MHz of frequency coverage each. Additionally the advertised computer interface did not appear.

In view of the above and because of the fact that the SX-400 came nowhere near the standard required of a Commercial or Military quality programable scanning receiver GFS Electronic Imports decided not to handle the SX-400. Additionally they are expecting to be able to release in Australia, during Summer a very much improved programmable receiver, the SX-600.

AR



POCKET PROGRAMABLE SCANNING RECEIVER

GFS Electronic Imports announce the recent arrival of a new upgraded version of the Microcomm model SX-150 HF/VHF/UHF programmable pocket receiver scanning receiver.

This new version features many improvements over its earlier predecessor including a UHF sensitivity of better than 0.45uV for 12dB SINAD as well as a new BNC antenna socket. Additionally the helical rubber duck type antenna has been redesigned in order to improve its performance on all bands particularly VHF and UHF. Most of the SX-150's other unique features remain unchanged.

Microcomm's SX-150 is supplied complete with rechargeable NiCAD batteries, battery charger, carrying case, earphone and rubber duck antenna. It is priced at $499.00 including sales tax plus $12.00 P&P.

For further information contact GFS Electronic Imports, PO Box 97, Mitcham, Victoria 3132, or 17 McKeon Road, Mitcham. Phone: (03) 873.3777.

AR

POPULAR RTTY/CW COMPUTER INTERFACE

MFJ Enterprises of Missisippi USA recently released in Australia, a new computer interface. Known as the MFJ-1224 it is designed to interface to a wide range of personal computers including the VIC-20, Apple, TRS-80C, Atari, TI-99 and Commodore 64.

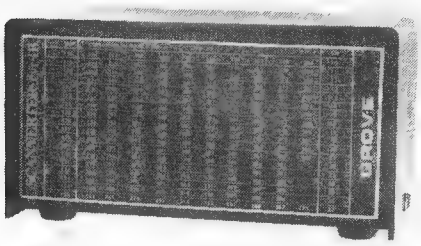
With versatility in mind MFJ have incorporated a number of novel features in the MFJ-1224. These include suitability for operation over a wide range of shifts including 850 Hz, 425 Hz, 170 Hz as well as all shifts between and beyond. A sharp eight pole active filter is included for 170 Hz shift and CW. It will also operate 5 to 100 WPM on RTTY/CW and up to 300 Baud on ASCII. A convenient NORMAL/REVERSE switch eliminates retuning when stepping through various shifts and a built in automatic noise limiter helps improve copy under noisy conditions.

Tuning is made relatively easy by a two LED tuning indicator which provides for fast positive tuning. RTTY signals are copied on both the mark and space tones, not mark only or space only. If either the mark or space are lost the MFJ-1224 maintains copy on the remaining tone.

A range of transmitter keying ouputs are provided including ASFK, FSK with PTT. High voltage grid block and direct keying are also included for CW. There is also an external hand key or electronic keyer input socket for convenience.

For further information contact, GFS Electronic Imports, 17 McKeon Road, (PO Box 97) Mitcham: Vic. 3132.

AR



CONVERTER FOR SCANNING RECEIVERS

GFS Electronic Imports of Mitcham Victoria, recently announced the availability of a converter designed to allow a programmable scanning receiver to cover the frequency range 215 to 400 MHz using the VHF aircraft band as its IF.

The Model CVR-1B Scanventer is designed to couple with any scanning receiver that covers the VHF Aircraft Band. It may also be used in conjunction with a general coverage shortwave receiver over the frequency range 10 to 27 MHz. Operation is made simple by virtue of the fact that the CVR-1B just connects in series with the antenna of its last receiver. Both power and antenna cables are supplied.

Within the 215 to 400 MHz band lie a wide range of interesting channels, including the Air Force's air to ground and air to air frequencies, the Space Shuttle, a number of military satellites.

Price of the CVR-1B is $244.00 plus $8.00 P&P.

For further information contact GFS Electronic Imports, 17 McKeon Road, Mitcham, Victoria, 3132 or PO Box 97 Mitcham. Phone: (03) 873.3777.

AR

RECEIVE BROADCAST AND SHORTWAVE

The model CVR-2 Globescan converter is now available in Australia. It is designed to provide the VHF Scanning receiver user with access to both the MF and HF bands.

The CVR-2 Globescan connects in series with the host scanning receiver's antenna and makes use of the airband as its IF. For example 500 kHz corresponds to 114.5 MHz while 30 MHz appears at 144 MHz on the scanning receiver. When used with receivers which do not have full coverage from 114 to 144 MHz a correspondingly reduced range of shortwave bands will be covered.

Neat and compact in size the Globescan shortwave converter measures only 10W x 5H x 7.50cms. Its power requirement is 12 volts DC at 20 mA. Price of the CVR-2 is $202.00 plus $8.00 P&P.

For further information contact GFS Electronic Imports, 17 McKeon Road, Mitcham, Victoria or PO Box 97, 3132. Phone: 873 3777.

AR

QSP

"MORSE CODE REQUIREMENT — YES!"

In recent times we have heard many arguments for the no-code licence in Australia.

Australian amateurs may find it interesting to know that the American Federal Communications Commission has observed and recorded the overwhelming sentiments of the majority of United States amateurs and has therefore decided to relinquish the issue of a no-code licence in the Amateur Radio Service.

Of the large response to the Commission's survey, the vast majority, almost 20 to 1, were against removing the Morse code requirement for radio amateurs. The FCC's Private Radio Bureau Chief, Robert Foosaner, stated that the vote for the retention of Morse code as a prerequisite for an amateur radio licence was an indication of the health of the Amateur Radio Service.

The Chief went on to say, the Amateur Service is well, is thriving and is providing an excellent service to the American public.

VK3QQ

AR

EDUCATION NOTES

Brenda Edmonds, VK3KT
FEDERAL EDUCATION OFFICER
56 Baden Powell Drive, Frankston, Vic 3199

Statistics for the May 1984 examinations have been released and are available from me or from the Executive Office on request.

Since this was the first time that both levels of Theory were examined on the one day, the results cannot really be compared with those for other years. Several sets of figures under the new system will be needed before the effects of the change can be clearly seen.

I do not know whether any candidates sat for both levels on the one day, or how many were sitting for the second (third etc) time.

Figures for CW are much as usual — more candidates pass the sending than the receiving, and the Regulations pass rate of 85% overall is higher than average.

If we look at numbers of candidates only, there were nearly as many Novice candidates in May 1984 as in May 1983, but there were also 474 candidates for AOCP Theory, which is almost half as many as have sat the last two August examinations. It will be interesting to see whether the numbers drop in August.

The pass rates for the Novice Theory were overall a little lower than for the last few exams — range 36.6% for VK4 to 77.8% for VK7 (7 out of 9 entrants) making a total pass rate of 44%.

However the higher level results were better than they have been lately — 46.8% ranging from 16.2% for VK6 to 66.6% for VK7. These extreme figures are biased by the small numbers of entrants from those states.

However VKs 2, 3, and 4 each had over 100 candidates, and their rates average 47.8%. It is very pleasing to see these improved pass rates, and tempting to conclude that the shorter time between exams had something to do with it.

Both syllabuses are at present under review, and I will be looking for some feedback on ideas of what to include, eliminate or extend. I intend to circulate copies of amended syllabuses to some of those who are running classes for their comments, but would be happy to hear from any amateurs who have ideas, particularly about the degree of depth for various topics. I can be reached QTHR or would be pleased to hear comments on the Education Net which I am trying to maintain — Thursday evenings, 1130 UTC, 3.685 — + MHz. I am sure there is a place for a Net to encourage contact between Class Co-ordinators or lecturers, but have not had very much success with it of late.

It could be very productive if we could use it to discuss changes to the syllabus, or exam matters. I realise the frequency limits its use to Full Call amateurs, so I would be very pleased to know how many Limited or Novice operators are running classes, and where, so that alternative arrangements can be considered.

I would also appreciate some feedback on the values of publishing Sample Exam papers in AR. Should they be a regular feature? How often? Please have your say.

73

Brenda VK3KT

AR

Education Information is available from Brenda VK3KT.

ICOM - The World System

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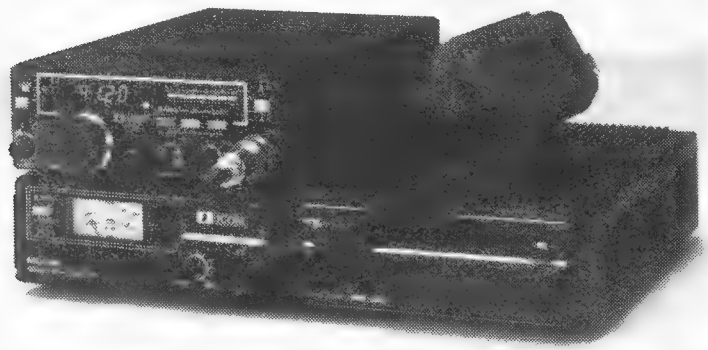

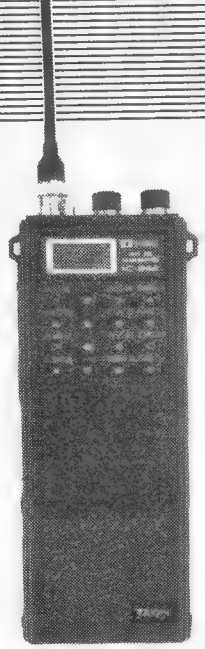

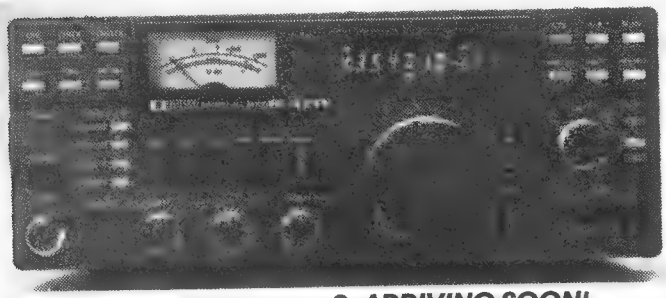

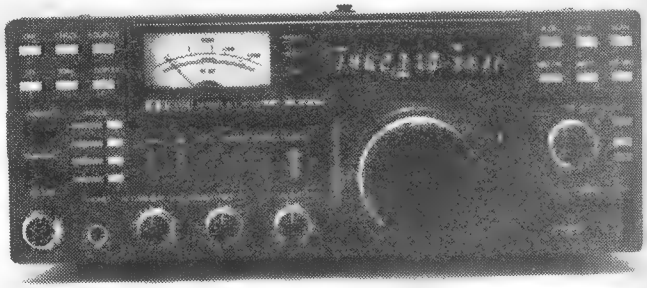

1. IC-120
1.2 GHz mobile compact unit with 6 memory channels plus 2 VFO's, memory and frequency scanning, duplex facility, even RIT, plus green LED readout. 1 Watt output. Optional ML-12 power booster and PS-45 power supply units are shown.

2. *ARRIVING SOON!*
IC-04A
The latest in hand-held transceiver technology. 16 button keyboard controls frequency entry and control functions. Features also include priority, scanning of the 10 memories and programmable band scan. Frequency range between 430 and 439. 995 MHz. Wide range of accessories available, and built for years of hassle-free operations.

3. IC-02A
Direct entry, microprocessor controlled, a full featured 2 meter hand-held, other features include scanning, 10 memories, duplex offset storage in memory. LED readout and as shown, a wide range of compatible optional accessories are available.

4. IC-R71A
2MHz – 30MHz general coverage receiver, with innovative keyboard frequency entry and (optional) infra-red remote control 32 programmable memory channels SSB/AM/RTTY/CW/FM, dual VFO's, scanning, selectable AGC and noise blanker all this means unmatched versatility and performance in its price range. Computer compatible with optional EX 309 fitted.

For further details, see your nearest Authorised ICOM Dealer:

SOUTH AUSTRALIA
Jensen Intersound, 75 Prospect Rd, Prospect (08) 269 4744
International Communications Systems, 8 Nile St, Port Adelaide (08) 47 3688
Set Services, 68 Sturt St, Mt Gambier (087) 25 2228
Stallard Communications, 27 White Ave, Lockleys (08) 352 3714

NORTHERN TERRITORY
Farmer Electronics, 31c Elder St, Alice Springs (089) 52 2967
Integrated Technical Services, 1 Carey St, Darwin (089) 81 5411

TASMANIA
V. K. Electronics, 214 Mount St, Burnie 31 7733
Gelston Communications, P O. Box 1311, Launceston 27 2256
Advanced Electronics, 5a The Quadrant, Launceston 31 7075

QUEENSLAND
C W Electronics, 416 Logans Rd Stones Corner (073) 97 0888
Amateurs Paradise, 142 Castle Hill Drive Nerang (075) 58 2293
Robco, 51-53 Inghams Rd, Townsville (077) 72 2633
Trade Wind Sailing, 115 Tenth Ave, Railway Estate (077) 72 4021

7 Duke Street, Windsor, VICTORIA 3182
Phone (03) 51 2284, Telex AA 35521 ICOMAS

WARNING: When purchasing an ICOM unit please confirm that you are dealing with an **Authorised ICOM Dealer** as the ICOM Warranty applies only to units supplied by ICOM Australia Pty Ltd., to Authorised ICOM Dealers

All Stated specifications are approximate and subject to change without notice or obligation

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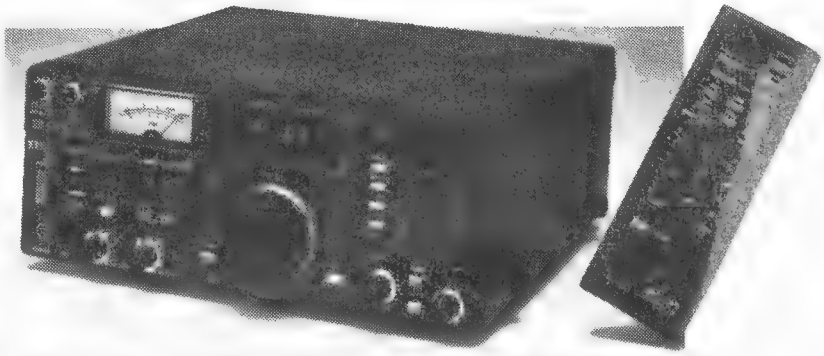
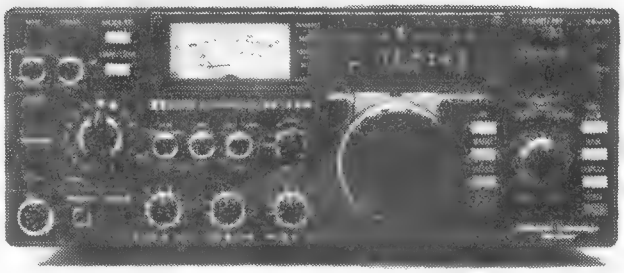
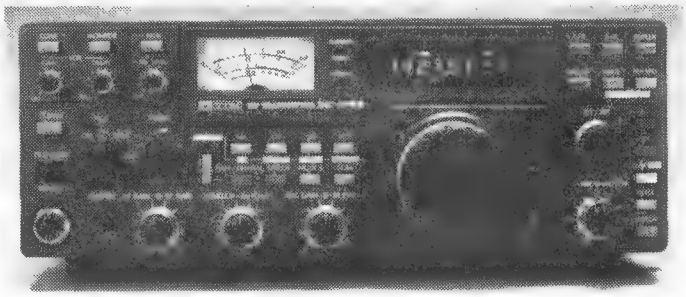






5. *NEW!* IC-471H
Deluxe 430 – 450 MHz base transceiver with phase lock loop for extreme accuracy, easy to read two colour display, memory scanning and programmable band scan, 75 Watt PEP transmitter output (adjustable) in a compact unit with all the reliability of every ICOM product. Options available include internal AC power supply PS 35.

6. *NEW!* IC-271H
With 100 Watt transmitter, a transceiver ideal for use with repeater or simplex. 32 full function tunable memories, PLL locked at 10Hz, flourescent display for high visibility, frequency scanning mode, duplex check switch, all-mode squelch, S-meter, lithium battery memory backup, accessory connector and microphone. 12 V DC operation, plus a wide range of optional accessories including internal AC power supply PS 35.

7. *OUR BEST SELLER!* IC-745
The 'All in one" Amateur band transceiver and general coverage receiver with SSB, CW, RTTY, AM (receive) plus FM option, with optional internal power supply. Other features include IF Shift, passband tuning, notch filter, and other wanted features including 16 memories, scanning, dual VFO's and lithium battery memory backup. Wide range of optional accessories also available.

8. ICOM IC 751
Popular 100KHz – 30MHz receiver, with 32 tunable memories, programmable scanning, passband tuning, can be interfaced with a computer, dual VFO's, full function metering, SSB and FM squelch, easy to read flourescent display. Internal optional power supply, lithium battery memory backup and a large range of optional accessories including optional voice synthesizer E310.

VICTORIA
Eastern Communications 168 Elgar Rd, Box Hill South (03) 288 3107
GFS Electronics, 17 McKeon Rd, Mitcham (03) 873 3777
C.S.S., 600 Nicholson St North Fitzroy (03) 481 2444
Codlin Communications, 84 Albert St, Moe (051) 27 4516
Wecam, 11 Maimesbury St, Wendouree (053) 39 2808
Ansonic Electronics, P.O Box 2115, Port Fairy (055) 68 1134
Geelong Communications, 4 Fenwich St, Sth Geelong (052) 21 2109

WESTERN AUSTRALIA
Communications Systems, 88 Guthrie St, Osborne Park (09) 445 1333
Bay Radio, 18 Banksia St, Bunbury (097) 21 2236
Hocks TV Rentals, 294 Hannan St, Kalgoorlie (090) 21 1906
Wills Trading, 445 Murray St, Perth (09) 321 2207
Linear Electronics, 14 Trailwood Dve, Woodville 409 1272

NEW SOUTH WALES
Emtronics, 94 Wentworth Ave, Sydney (02) 211 0988
Webb Electronics, 1074 Mate St, Albury (060) 25 4066
Macelec, 99 Kenny St, Wollongong (042) 29 1455
Amateur Electronic Imports, P.O Box 160, Kogarah (02) 547 1467
Landlink Communications, Mullaley Rd, Gunnedah (067) 42 2838
Rivercom, 9 Copeland St, Wagga Wagga (069) 21 2125
D.X. Engineering, 5 Jasmine St, Port Macquarie (065) 82 0175

Discover a new deal with ICOM Australia

ICOM

The World System

HOW'S DX

Ken McLachlan, VK3AH
Box 39, Mooroolbark, Vic 3138

With DXers on the lookout for QSO's on the lower bands, as the higher bands become less reliable due to the sunspot minima. On quiet solar days, the 10.7cm Solar Flux levels are hovering around the 065 level and that is the projected bottom of the solar cycle according to Lee KH6BZF, in his weekly report from Hawaii.

The Italian amateurs, in a bid to pursue their hobby have found themselves in a dilemma, as portions of the 80 metre amateur bands have been removed by the authorities and given to commercial enterprises.

The Italian amateur now has only two segments of this band at his disposal, 3.613 to 3.627 MHz (14 kHz) and 3.647 to 3.667 MHz (20 kHz). Any amateur will appreciate the problems associated with this loss. The geographical location of this country, with neighbouring countries having use of the majority of the band, the commercials are going to give and receive a lot of QRM.

With the WARC bands not distributed for use in Italy, and for that matter in a lot of other countries yet, apparently licensing in Italy has become fairly rigid over the last twelve months, one specification being that each licenced amateur must operate from his home or designated QTH on all bands including VHF. Of course this is why one does not hear mobile operations from this country.

As amateurs, I personally feel we should all consider how lucky we are to have the minimum of restrictions placed upon us in our operating habits by the authorities and thanks are due to the WIA over the years that has sought and obtained the privileges we now enjoy.

PREFIX HUNTERS BONANZA

Prefix hunters within VK and overseas will have a rare opportunity to gain a rather unique Australian prefix from early November.

The Victorian Division of the WIA have secured the call VI3WI to celebrate the 150th Anniversary of the State of Victoria and it will be used on all bands in the modes of SSB, CW and RTTY for a period of six months. Full details may be found in the VK3 Notes in this issue.

QSL information is VK3WI QTHR, or via the Bureau.

MAYOTTE FH4

The new prefix from this island is FH4 and those that are very wary of the dentist, should not be deterred in contacting Jack FH4AA (home call F6ECS) if they want a new country confirmed. Jack is the resident dentist, hoping to be there for the next twelve months. Jack has been frequenting the bands on CW and SSB when not caring for the caries of the island's populous. QSL's should go to PO Box 4, Mamoutzou, Mayotte 97600 France. There are other avenues for mail to get to the island but I have found that sending all French island possessions mail through France seems to be the most reliable method.

ETHIOPIA

Question: *Where did Tensay ET3PS disappear to for such a long period?* He vanished like he came and only recently has he reappeared, spasmodically on weekends around 14.235 MHz at odd hours. *Has anyone received a QSL card from the operation as yet?* Zedan JY3ZH avoids the question when the subject is broached, yet he spent a lot of time on Zedan's nets.

WEST MALAYSIA ON THE LOW BANDS

Dick NN6U, will be operating under the call of 9M2RT and will be heard mainly on the low bands. Dick's QTH is Penang and intends to be operational until the end of June 1985.

ANOTHER UN AREA

Yet another United Nations area has sprung up, this time in Costa Rica. The "University of Peace", using the call 4U1UP has been worked in VK on twenty metres and appears to be under United Nations sponsorship based on extra-territorial soil located in Colon City. It can probably be likened to 4U1VIC in Vienna, which unfortunately didn't meet the criteria for ARRL DXCC status.

The Yearbook of the United Nations describe the University of Peace as *"a specialised international institution, within the system of the United Nations University, for post graduate studies, research and dissemination of knowledge specifically aimed at training for peace."*

Personally it is felt that 4U1UP will suffer the same fate as 4U1VIC, unless the Costa Rican Amateur Society can present a better case or are more persuasive than their Austrian counterparts. QSL to 4U1UP, University of Peace, PO Box 199-1250, Costa Rica.

SPRATLY ISLANDS

Still awaiting a card for the mid year 1983 expedition? It appears that Chito may be sending his logs to WB0TEC and it is very unclear whether he will also send the multitude of cards and the accompanying monetary value of return postage received, along as well. Further developments, if any, will be reported!.

THE YL VOICE FROM WILLIS ISLAND

History was made earlier this year, when the Meteorological Station at Willis Island staff of four, included Denise Allen, a YL Weather Observer. This is the first time a YL has lived and worked on the remote island.

Denise and Graham VK9ZW wait for Andy VK9ZA and the change-over crew.

I recently had the pleasure of interviewing Denise, whilst she was enjoying leave in Melbourne, on the broadcast band Radio Station 3RPH (Radio Print Handicapped see story page 14 August AR) for three fifteen minute programmes, where she capably described the island, its history and the necessity for the Bureau's weather forecasting, to the station's listeners. Denise was ably supported in the programmes by Gavin VK3HY, who was stationed on the island sixteen years ago and used the call of VK4EV.

Photograph by Ken McLachlan VK3AH

Denise and Gavin VK3HY at the 3RPH interview console.

Denise, whilst on the island, saw what a wonderful hobby we are privileged to pursue and decided that she would set her sights on a licence. Graham VK9ZW was delighted with her enthusiasm and coached her in theory, CW and operating prcedure in their off duty hours. Denise, since leaving the island has pursued her studies in readiness for the DOC examinations, in which we wish her every success.

BOOK REVIEW

A book that would be invaluable for the operators of 80 and 160 metres has been forwarded to me by the author, John ON4UN. The 130 page book comprises tables of sunrise and sunset times for the 1st and 15th day of each month throughout the year to 502 geographical locations across the world.

From the tables given, one is able to obtain the most probable time propagation will occur on either long or short paths. All VK call areas are catered for plus all the Australian islands.

The introduction includes instructions for its use, a personal computer printout of short path beam headings and distances in kilometres to over 500 locations (VK capital cities in each state plus each island) from your QTH. Also included is a large type print out of actual sunrise and sunset times at your QTH.

The book is compiled by John ON4UN, an avid low band DXer who wrote 80 Metre DXing, of which over 12,000 copies have been sold. Personally is felt that these tables, complete with the computer readouts, are excellent value for a $10 investment of an International Money order to John Develoldere ON4UN, 215 Poelstraat, B9220 Merelbeke. Belgium which includes surface mail postage. It is anticipated that Air Mail would be slightly extra, the book and contents weigh approximately 240 grams.

PETER I ISLAND VISITED

This new DXCC addition to the lists has been visited by an amateur, unfortunately without equipment, in early February this year. WB3KLQ was travelling aboard the "Lindblad Explorer" which anchored 3 kilometres off the island. The vessel was on a 37 day jaunt of the Antarctic and some of the crew had the opportunity to land on Peter I Island.

A few quotes from this amateur's experience are worth reiterating *"On a westerly course we passed by the eastern shore about eight kilometres off the coast and found no apparent beach, then travelling around the north tip to the western shore, about half way down, we found Kapp Ingrid Christensen (a precipitous, barren promontory), where we decided to land.*

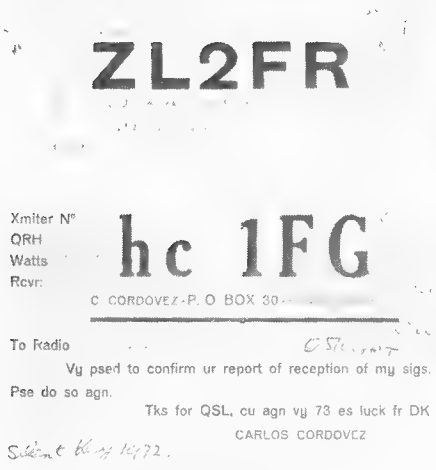
Landing by a Zodiak, which is an inflatable type rubber boat with a 25HP outboard motor, made the approach quite easy but the landing was somewhat tricky, due to the surf. A pleasant little cove protected a beach covered with lava bits. In shore lava covered mottled ice where tents and equipment could be well placed. A rocky highland above the cove, keeps the wind off this protected area of possibly an acre or so in extent. In 1982 or early 1983, a Zodiak with 9 or so on board visited the island, as a metal plaque from the Russian research "Vostok" showed that the island had been visited."

WB3KLQ recommends that landings on the island could be made during the months of late December, January and early February though this is the first year that the vessel has been able to get closer than 8 to 18 kilometres off shore.

With the above in mind, a DX operation in the near future could well be in the minds of many enthusiasts.

CARDS OF YESTERYEAR

Two cards of the "thirties" from Eric L30042's collection. Thelma ZL2FR's card of 1931 with the apt notation of *"A million miles or just around the corner I QSL"* and Carlos HC1FG's card of 1933. Both operators are now silent keys.



PREFIX VARIATIONS

With the advent of many variations in prefixes around the world in the last couple of years, Al W4VP, was prompted to write the following verse which is felt to be very appropriate and is reproduced from the weekly DX newsletter QRZ DX.

I thought I had it easy,
Now I'm climbing up the wall,
Every country in the whole darned world,
Is playing Scrabble* with their calls.

Oh give me back the good old days,
When I knew who was where,
And chasing DX something more,
Than pulling out my hair.

The Canadians now use "C" or "X",
The French are into "T"s,
The States are hopelessly confused,
As are the Japanese.

I had the Russians memorised,
Could tell them all apart,
Now I'm back beyond square one,
Making a fresh start.

I'd like to know the reason why,
This all did come to me,
For the callsign mess on the bands,
Is getting the best of me.

I listen for the DX now,
Prefix chart in hand,
And try to guess which strange new call,
Might be some rare exotic land...

*Registered trademark of Selchow and Righter.

OVERSEAS PICTURES

From L to R: Well known DXer's LU2DX, K3ZJ, W3AZD with Dave K1ZZ General Manager of ARRL.

The annual Dayton Convention attracts some notables and this year was no exception. Bob W5KNE, Editor and Publisher of QRZ DX caught up with some well known personalities whilst his XYL Bonnie minded the QRZ DX display.

From L to R: Some of the DX Editors that attended the Convention included Al VE3FRA (DX Report), Jim K1TN (The DX Bulletin), Rob W5KNE (QRZ DX), Jan K6HHD and Jay W6GO publishers of Jan and Jay's QSL Manager List.

Bonnie minding the "Shop"

Photographs courtesy of QRZ DX

DOT AND DASH PRIZE

The annual Dot and Dash Prize that is awarded by the DX Family Foundation and is based on the criteria of the development of the hobby, contribution to a better international understanding, outstanding operating practice and courteous operating was awarded to the operators of XU1SS and XU1YL in Ampil, Cambodia for 1984. The award is a scroll and inscribed plaque made of marble.

MOUNT ATHOS UPDATE

An update on last month's comments regarding DJ5CQ's operation from Mount Athos, report that the operator did visit Mount Athos, had his photograph taken with two of the monks, which has been placed on his QSL card, but he forgot to take any equipment with him. It appears that the 2000 plus contacts were made from Ouranopolis, which is in mainland Greece. Therefore signing DJ5CQ/SV/A would be a pirate operation if the above facts are correct.

SURPRISE!!!

Percy VK3PA, well known ANZA and Pacific DX Net controller, on a whistle stop tour around VK to catch up with many friends, really didn't expect such a welcoming committee of 2000 when he stepped off the aircraft in Adelaide, (they were there to welcome a "Pop Star"). More surprises were to come when he arrived in VK8, but only Percy could relate the story.

BITS AND PIECES

The call GB0GMT was used to celebrate the centenary of Greenwich Mean Time (UTC).*** Bert KA4SBE/SU QLS's should be directed to W1GGQ, as he has now left the country.*** VR6KY is active again and her QSL arrangements are through NE5C.*** Ghis ON5NT was active from HB0 on all bands late July, mainly CW with a little SSB. QSL's to ON7FK.*** It is believed that 9L1EX alias 3X4EX, licence has expired and contacts may not be acceptable for any DXCC credits.*** QSL's for the special event Olympic calls of W84OG and K84OG, which were under the auspices of the American Red Cross and the Northern California DX Foundation, go to PO Box 9007, Stanford, CA 94305 or via the W6 Bureau for a special QSL card. Cards for NG84O will be handled by the ARRL Sixth District QSL Bureau, PO Box 1460, Su Valley, CA 91352, USA if you wish a direct reply or via the Bureau.*** Dr Ross Vining, one of the organisers of the Heard Island Expedition, was so taken with the hobby that he studied and passed the Novice and Limited requirements and now holds the call VK2XEE.*** An upgrading is expected before he travels south with "Operation Blizzard" later this year.*** TJ1QS is active again after having his equipment confiscated, which was apparently an error of judgement on the authorities' part.*** XU1SS and XU1YL operators are involved daily in the "Voice of Khymer", on the frequency of 1250 kHz.*** Well known

Operators of XU1SS and XU1YL that received the Dot and Dash Prize.

DXer and a controller of the Pacific DX Net, Dave ZL1AMN, has retired from the "salt mines" and should be presently enjoying a tour of USA and Europe with his XYL Aola.*** Did you ever contact 9F3USA between 4th April 1971 and 19th January 1972 and have not received a card? Don't lose heart as VE3IG still has the logs of this operation along with the logs of ET3USB. A note, card and SAE with some IRC's should bring results.*** Taiwan will issue some more licences to residents in that country in the near future.*** 4W1A heard??? but is it genuine?*** Noel 8Q7AV, is QRV most days between 1300 and 1500 UTC, but it is very hard to attract his attention with his beam orientated on the United States, even when he is calling CQ, with an S9+ signal in VK.*** Eric L30042, as one reads the column this month, should be living it up on a well earned trip to Europe. His listening reports will be missed until his return.*** American amateurs are placing more pressure on the FCC to increase their share of eighty and fifteen metres.*** All DXer's will be saddened to hear of the death of Den VK7DK, always friendly, a credit to the hobby he loved, an excellent SEA Net Controller and a gentleman at all times.

THANKS

Sincere thanks are extended to all subscribers to this column including of course the Editors of all the magazines and newsletters that are received. Newsletters include ARRL NEWSLETTER, RSGB DX NEWS, QRZ DX, LONG SKIP, DX FAMILY FOUNDATION NEWSLETTER, KH6BZF REPORTS, JAN and JAY O'BRIEN'S QSL MANAGER LIST and the PAPAKURA RADIO CLUB NEWS. Magazines include cqDX, QST, RADCOM, WORLD RADIO, 73, BREAK IN, VERON and OZ.

Members contributions include input from VK2PS, 3FR, YJ, YL, 6FS, NE and L30042. Overseas amateurs who have contributed include G3NBC, I8SAT, W5KNE, ZL1AMM and ZL1AMN. Thanks again and good DXing to all readers.

QSL DIRECT TO:

3D2MP, PO Box 5234, Suva, Fiji.
5B4JR, PO Box 392, Paphos, Cyprus.
5Z4JD, PO Box 6, Migwani, via Kitui, Kenya.
CE0FQV, PO Box 1, Isle de Pasqua, Chile.
CE0ZIJ, PO Box 1, Easter Island via Chile.
CN8MB, PO Box 12588, Casablanca, Morocco.
EA9GT, PO Box 556, Ceuta via Spain.
J28RDD, PO Box 2417, Djibouti City, Djibouti.
VP2V Bureau, British Virgin Islands QSL Bureau, PO Box 653, Road Town, Tortola, British Virgin Islands.

QSL MANAGERS

3D2DX-VE5RA, 3X4EX-N4CID, 3D6AJ-WB3CQN, 5X5GK-JA1BK, 6W1/NR4J-W0ZUZ, 7X2BK-F6EWK, 8P6NX-W0SA, 9U5JM-ON5NT, A22ME-AK1E, A22TE-AK1E, A22CA-AK1E, A35SA-JM1MGP, CN8CC-F6FNU, CN8CX-HB9AGH, CT0BI-CT4UW, H44R-H44DX, J28DM-F6GYF, J28DX:F1CFD, J39BS-WB2LCH, J73DF-N6CRU, JT1AO:W7PHO, JX5DW:LA9PCA, TU2NW-AK3F, XE2FU:K5RC.

AR

ALARA

Australian Ladies Amateur Radio Association

Margaret Loft, VK3DML
28 Lawrence Street, Castlemaine, Vic 3450

Standing L to R: Judy VK3PRC, Joyce VK3VBK; Murial May; Raedie Fowler; Mavis VK3BIR; Bron VK3NTD; Mavis VK3KS; Barbara VK3BYK; Austine VK3YL; Gwen VK3DYL; Margaret VK3DML; Jessie VK3VAN; Kim VK3CYL; Seated Jean Truebridge; Irma VK3BBJ; Valda VK3DVT.

Photo right: The party cake beautifully made and decorated by Margaret VK3DML and her neighbour.

SURPRISE PRESENTATION

On Saturday 7th July a surprise presentation for Austine VK3YL was arranged at Valda VK3DVT's QTH. Sixteen YL's, three OM's and three harmonics attended. The presentation was to commemorate Austine's fifty-four years as an amateur. A tooled leather log book cover and orchid spray were presented by Margaret VK3DML.

Thanks to Valda and Pat for the loan of their house, Mavis for ringing all the girls and also a big thank you to Ken VK3AH for taking the photos.

It was lovely to have so many attend and give all the opportunity to meet Austine. I met four new YL's.

Welcome to new members Lori VK4FFQ 27.6.84 and Anne GM4UXX 23.5.84.

MILDURA GET-TOGETHER

Mildura Weekend is only two weeks away now and I am really looking forward to meeting some of you for the first time. The numbers have been steadily increasing and most states will be represented.

Get Well Wishes are extended to Joan VK3NLO who has been in hospital, do hope by now Joan you are back on deck again.

ANNUAL MEETING

Our Annual Meeting was held on 23rd July and as most have indicated they are willing to continue for another year, office bearers are:

Helene	*VK7HD*	*President*
Joyce	*VK2DIX*	*Vice President*
Marilyn	*VK3DMS*	*Vice President and Minute Secretary*
Jenny	*VK5ANW*	*Secretary*
Valda	*VK3DVT*	*Treasurer*
Marlene	*VK5QO*	*Editor*
Margaret	*VK3DML*	*Publicity and Contest Manager*
Mavis	*VK3KS*	*Awards Custodian and Historian*
Joyce	*VK3VBK*	*Souvenir Custodian*
Jessie	*VK3VAN*	*Sponsorship Secretary*
Bev	*VK6DE*	*Librarian*

State Representatives

VK 1/2 Can you help?

VK3DMS	*Marilyn*	*VK4AOE*	*Margaret*
VK5YJ	*Joy*	*VK6YF*	*Poppy*
VK7	*Unknown*		

As a new year starts for ALARA may I take the opportunity to wish all the office bearers a very happy and successful year. Thank you to all for the last year's efforts and hope that you enjoy the new year and that ALARA continues to grow in the future, under the leadership of your very enthusiastic executive.

For enquiries re joining ALARA please write to Valda VK3DVT, PO Box 4, Middle Brighton, Vic 3186. Membership is $5.00 yearly and new members are always very welcome.

ALARA's Fourth Contest is coming up very soon on Saturday 10th November 1984 from 0001 UTC to 2359 UTC. Full details in October AR contest column, or a copy of the rules are available from me for a SASE to above address.

Mrs FLORENCE McKENZIE CW TROPHY

This will be awarded to the Australian YL Novice operator with the highest CW score. Minimum score 50 points (CW).

Photograph this month is the group at Austine's presentation.

Until next month 33/73/88 to all

Margaret VK3DML

AR

KENWOOD

NEW KENWOOD HAND HELDS

TR-2600A
2M FM TRANSCEIVER

FEATURES

● EXTREMELY COMPACT SIZE AND LIGHT-WEIGHT Maximum attention was given in design and component layout to assure minimum package size and weight consistent with advanced electronic capability and performance. ● HIGH IMPACT COLOR MOLDED CASE. Provides extra strength and durability to resist damage from rough handling or severe physical shock while at the same time providing enhanced appearance and styling ● DCS (Digital Code Squelch) Allows the operator to program the transceiver to respond only to those transmissions that incorporate a preselected digital data signal ● LARGE LCD DIGITAL FREQUENCY READOUT. Easy to read, in direct sunlight, or, in the dark using the built-in lamp switch ● TEN MEMORY CHANNELS. ● LITHIUM BATTERY MEMORY BACK-UP. ● MEMORY SCAN PLUS PROGRAMMABLE MEMORY SCAN LOCK-OUT ● PROGRAMMABLE AUTOMATIC BAND SCAN. ● BUILT IN "S" METER, WITH BATTERY INDICATION. Analog-type "S" meter indicates signal strength during receive, battery charge condition during transmit. ● KEYBOARD FREQUENCY SELECTION ● BUILT-IN PROGRAMMABLE TONE ENCODER (Optional) ● HI/LO RF POWER OUTPUT SWITCH. ● REVERSE SWITCH ● "SLIDE-LOC" BATTERY PACK

TR-2600A
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TH-21A
Ultra compact
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TH-21A
2M FM TRANSCEIVER

FEATURES

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CD-10 CALL SIGN DISPLAY

DCS "Digital Code Squelch", a revolutionary signalling concept for Amateur radio that utilizes the most advanced technology has just been announced by KENWOOD
Not to be confused with CTCSS (Continuous Tone Coded Squelch System), DCS uses digital code information to open squelch on a receiver that has been programmed to accept the specific code being transmitted. The system recognizes 100,000 different 5 digit code signals, making it possible for each station to have its own "private call" code, as well as to have a "group call" or "common call" code. DCS is also effective in suppressing unwanted signals. A 6 digit maximum Amateur station call sign may be programmed in ASCII code, and transmitted in conjunction with the DCS code. The digital data information group is transmitted automatically, whenever the transmit key is pressed and released. An optional "Call Sign Display" is available that stores the calling station call sign in its memory, for future reference, and also displays it on an LCD readout. The "Call Sign Display" is capable of storing the call sign data of up to 20 stations, allowing the operator to quickly check for calls if he has been absent from his radio, and to review his contacts for logging purposes.
The DCS/ATIS code uses mark and space frequencies within the normal speech bandwidth of which can easily be handled by a repeater

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PACKET RADIO

David Furst, VK3YDF
131 Church Street, Hawthorn, Vic. 3122

PACKET RADIO IN AUSTRALIA – the early days

Guest Columnist: Jim Swetlikoe VK2BVD
Sydney Amateur Digital Communications Group
PO Box 231, French's Forest, NSW, 2086.

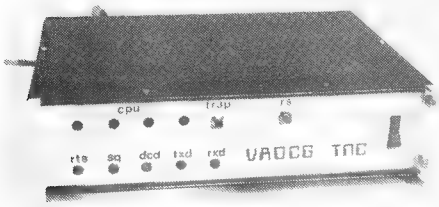
The mature state of amateur packet radio today in Australia is in marked contrast to the four stations that struggled to make contact with each other eighteen months ago.

The packet radio links that exist today go right back to the founding meetings of the Vancouver Amateur Digital Communications Group (VADCG) in 1978-79. Doug Lockhart VE7APU, held a number of meetings at his home to thrash out the design objectives for a radio-based amateur digital communications network. The catalyst for the effort was the authorisation of digital packet radio operation by the Canadian Department of Communications, and, the release by Intel of an amazing piece of silicon: the 8273 HDLC protocol controller chip. It was the availability of this device that brought the costs of implementing computer communication networks down to the personal level.

Recognizing that an 8273 combined with a microcomputer could do the same job as dedicated computer network controllers costing thousands of dollars, Doug set about trying to convince others.

Before long, the Land of Oz beckoned and VE7ABH left the group to re-establish Down Under. Now VK2BVD, a slim thread of contact was in place and the initial Vancouver newsletters kept up the interest in the Group's progress.

It wasn't until mid '82 that personal affairs were in order and time was found to get back into digital radio. Meanwhile, Doug and the fellows in Vancouver had made considerable progress: the initial design decisions to make a low-cost HDLC controller and prove the system on existing VHF radios now culminated in the VADCG Terminal Node Controller (TNC). Hardware was produced and software modules were written by VE7APU to drive the unit.

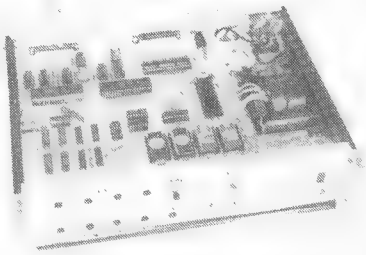


Terminal Node Controller. Photograph by VK2BVD.

The communications protocol was based on IBM SDLC procedures in common use in computer communications at the time (and today, for that matter). It was felt that this new mode would only get off the ground if professional techniques were used and the user interaction with the communications process was minimised.

To their credit, the VADCG participants made the TNC board and a parts kit available to all on a non-profit basis.

In late 1980, ASCII transmissions were allowed in the US and word quickly got around about an HDLC controller board from Canada. Experimenters from all over North America soon were lining up for one of these magic devices. The fellows in Vancouver managed to deliver and it is estimated that there are over 500 VADCG TNCs in amateur hands today.



Top view of VADCG TNC with RAM and ROM in foreground. Photograph by VK2BVD.

Back in Australia, with a TNC on order and realising that it takes two to tango, VK2BVD gave a talk to the local Manly-Warringah radio club hoping that some interest would take hold. It did. Steve VK2KFJ, and Peter VK2ZJO, decided to give it a go! A chance copy of an early VADCG newsletter from VK2BVD got John VK2ZXQ, interested and a fourth participant came in.

By Gosford Field Day 1983, John had his controller board beaconing and an effort was made to find a problem in Jim's unit and receive the transmission. This necessity for mutual assistance and close co-operation led to the casual formation of the Sydney Amateur Digital Communications Group (SADCG). The initial intent was to keep the group as unencumbered and informal as possible, to have fun, and to get on with the job of building a real-time data communications network!

Within days of the Field Day, VK2ZXQ and VK2KFJ were able to achieve a 'handshake' QSO from Sydney to Gosford. The following week VK2BVD resolved the chip problem and connected to VK2KFJ. With a mountain to the North, Gosford was out of the question!

A DIGITAL REPEATER!

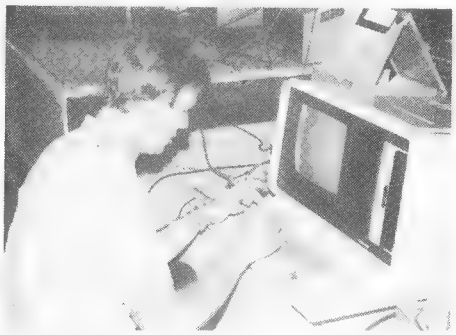
The obvious answer! Hadn't Doug mentioned that John VE3DVV, had just written such software to run in a VADCG TNC and had it on the air in Hamilton? A quick discussion with John Vandenburg VE3DVV, resulted in a diskette with a lot of good stuff on it! Further assistance from Stu Beal VE3MWM, provided packet port software for a 'host' RCPM computer connection. This version was reworked and debugged by John VK2ZXQ, and, following the successful performance on the Sydney RCPM system, has been sent back to haunt its originators in Eastern Canada!

Activity through the February to September 1983 period led to the experimental operation of a digital regenerator in Berowra. The TNC for this system was purchased by the Central Coast Amateur Radio Club and is indicative of the close support the SADCG receives from this club.

September saw VK2AQG and VK2ZAZ come to air and Oscar-10 became operational. Trial packets were monitored by Paul and Geoff as well as packets from Dr Hank Magnuski KA6M, in Palo Alto. At this time only a handful of stations in the world had put packets through this satellite.

A lot of consolidation took place over the spring and early summer as computers were inserted as terminals. In January, the Manly-Warringah Radio Society authorised a monthly SADCG packet radio information net which continues today.

February 1984 was Gosford Field Day again! We were stunned to realize that the SADCG was a year old and not very well known. An effort was co-ordinated to bring Australian packet radio out of the closet. Seven operational packet radio stations were set up in Gosford with an off-site ditigal regen and a 'host' computer running RCPM software. All stations were on the 7600 packet channel and an excellent demonstration of shared use of a single channel resulted. (See photos). Amazingly, everything worked flawlessly and there were no EMI problems!



John VK2ZXQ at a Remote Terminal Communicating with an Off-Premises Host Computer System at Gosford FD.

John VK2ZXQ explains technical details of a Terminal Node Controller to a visitor at Gosford.

HF APPLICATIONS

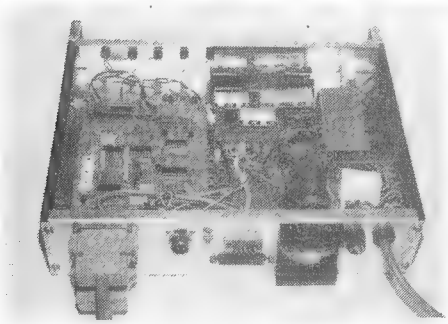
Interest turned to HF applications about this time. Whilst VK2BVD and ZL1AOX had exchanged 'monitor' mode packets the previous August '83, the first successful full 'connect' or handshake mode contact only occurred on 17 January, 1984. The following week VK2AQG and ZL1AOX succeeded in exchanging files between their respective computers.

About this time, our mutural interest in RCPM systems initiated contact with VK3ZMB and VK3YDF. By mid-March, three TNCs were on the way and the Melbourne Packet Radio Group was formed. The first stations were on air Easter Monday! The MPRG now has a packet-access RCPM system, ten participants, and is growing rapidly.

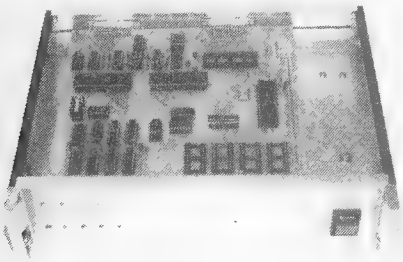
Liaison with the Adelaide group continues and inquiries have been received from the Brisbane area: VK4s XV, KJB, and ZE. The Adelaide group comprises VK5s AGR, KG, and GU.

Left:

Gosford Field Day – 19th February 1984. L-R Radio Packeteers Bob VK2ZLV, Paul VK2AQG, John VK2ZXQ, Geoff VK2ZAZ, Peter VK2XAD and Jim VK2BVD.



TNC Hardware – Modem, PS Regulator Board and Power Supply. (View from bottom.) Photograph by VK2BVD.



Improved Packaging. VADCG TNC under Construction. Photograph by VK2KFJ.

Bottom view. Power Supply and 1200 Baud Modem. Photograph by VK2KFJ.

This brief article has tried to provide an overview of the early days of packet radio development in Australia. It is by no means an exhaustive analysis. While much has been accomplished, much remains to be done!

Some of the obvious objectives are to digitally link Sydney and Melbourne via a virtual circuit data highway with extensions to Adelaide and Auckland. How such a project is implemented remains to be seen. Terrestrial UHF, satellite, and HF links have been proposed.

Special modems for HF data links are under investigation and good results appear possible. Experiments on direct keying of VHF or UHF FM transceivers are proceding.

Further software development is required for network level and higher level protocols. These areas are the keys to successful digital repeater links.

The Sydney Amateur Digital Communications Group encourages digital radio experimentation and invites participation by interested amateurs. VADCG TNCs and SADCG 7910 modems are available through the group. It's your hobby, now let's make it fun!

AUSTRALIAN PACKET RADIO DIRECTORY – 1.8.84

CALL	TNC ADR	NAME	MODEM
NEW SOUTH WALES			
VK2HL	62	Horst	ETI660
VK2IE	65	Ian	S/W
VK2ZN	61	Jack	SADCG
VK2AQG	72	Paul	SADCG
VK2AXA	76	Alan	SADCG
VK2AYD	70	David	SADCG
VK2BBF	6B	Guy	SADCG
VK2BFO	6A	Bruce	SADCG
VK2BQN	69	Brian	SADCG
VK2BIS	63	Morrie	Avtek
VK2BVD	91	Jim	VADCG
VK2BCC	7F	Col	SADCG
VK2BOA	60	Tony	S/W
VK2KFH	78	Fred	SADCG
VK2KFJ	94	Steve	SADCG
VK2KPD	66	Kevin	BBII
VK2KYJ	7E	Les	SADCG
VK2XAD	7A	Peter	SADCG
VK2XDS	7D	David	GDC
VK2XJC	67	John	Avtek
VK2XTC	68	Brian	SADCG
VK2YME	77	David	Avtek
VK2ZAZ	75	Geoff	Avtek
VK2ZBB	79	Gary	SADCG
VK2ZHM	7C	John	SADCG
VK2ZIU	74	Ian	SADCG
VK2ZJO	95	Peter	VADCG
VK2ZXQ	73	John	VADCG
VK2ZLV	7B	Bob	VADCG
VK2ZRQ	B9	Ross	VADCG
VK2ZWP	71	Chris	SADCG
VK2ZYI	64	Neil	
VICTORIA			
VK3AVE	A6	Peter	SADCG
VK3AZQ	A9	Peter	SADCG
VK3BIZ	A4	John	TAPR
VK3DJR	A7	Bill	SADCG
VK3YDF	A5	David	SADCG
VK3YRR	A1	Ian	SADCG
VK3ZVR	A2	John	SADCG
VK3ZMB	A3	Peter	GLB
VK3ZUU	A8	Vlad	SADCG
ACT			
VK1ZAH		Richard	TAPR
QUEENSLAND			
VK4XV	D1	Bob	TAPR
VK4ZE	D2	Merv	SADCG
VK4KJB	D3	John	TAPR
SOUTH AUSTRALIA			
VK5GU	E1	Terry	TAPR/VADCG/GLB
VK5KG	E2	John	TAPR
VK5AGR	E3	Grahame	TAPR
NEW ZEALAND			
ZL1AOX		Ian	TAPR/GDC
ZL3QL		Terry	TAPR
ZL3THJ		John	TAPR

27th JAMBOREE ON THE AIR, 1984

Amateur Radio Operators helping Scout and Guide Groups participate in the forthcoming 27th Jamboree on the Air are advised of the following details with respect to this activity.

Jamboree on the Air operates between 1400 UTC on Friday, 19th October, 1984 and 1359 UTC on Sunday, 21st October, 1984. Amateur stations may participate for all or any portion of that period by calling "CQ JAMBOREE" or answering a station using that call.

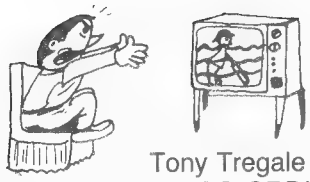
World Scout Bureau in Geneva has advised the following Calling Frequencies: *CW: 3.590, 7.030, 14.070, 21.140 and 28.190 MHz. Phone: 7.090, 14.290, 21.360 and 28.990 MHz.*

The Official Australian Jamboree on the Air National Opening Ceremony will take place from the grounds of Government House, Canberra, at 4000 UTC on Saturday, 20th October, using the official National Scout Headquarters Call Sign VK1BP. Three simultaneous frequencies will be used — 7.090, 14.190 and 21.190 MHz plus or minus QRM and the co-operation of all amateurs is sought in keeping these frequencies clear for thirty minutes prior to the ceremony to permit tests that will enable Australia wide Scout stations to choose the best listening frequency, and from 4000 UTC until the close of the call backs after the Official Opening Ceremony.

The Official Opening Address will be given by His Excellency The Governor General and Chief Scout of Australia, Sir Ninian Stephen, followed by an address to the Girl Guides by Lady Stephen, President of the Girl Guides Association of Australia. Supporting speeches will be given by Dr Norman Johnson, and Lady Angela Carrick, Chief Commissioners of Australia respectively for the Australian Boy Scouts and Australian Girl Guides Associations.

Technical facilities for VK1BP are being provided again this year by members of the Royal Naval Amateur Radio Society in Canberra under the supervision of Rear Admiral Jim Lloyd (Ret) VK1JL. Master of Ceremonies will be Commissioner Noel Lynch VK4BNL, National Co-ordinator for Jamboree on the Air. **AR**

NATIONAL EMC ADVISORY SERVICE



Tony Tregale VK3QQ
FEDERAL EMC CO-ORDINATOR
38 Wattle Drive, Watsonia, Vic. 3087

"EMI — UK — EMC"

One of Britain's leading technical journalists, Pat Hawker G3VA, describes in his column, Technical Topics, in the RSGB's journal, Radio Communications, the increasing interference problems we face as a result of the increase in the use of electronic devices produced for the home with little or no regard to their ability to work in harmony with each other... poor electromagnetic compatibility.

There is nothing new about the basic difficulty of operating a transmitter in a residential environment where your neighbours, or your family, do not share your interest in amateur radio — or at least not to the extent where they are prepared to tolerate, without protest, interference with their own pursuits or domestic appliances.

The late Gerry Jeapes, G2XV, once put into doggerel verse a plaint that must still be echoed by 50MHz experimenters as they wait for television programmes to end:

Up on aloft the antenna hangs high
Catching the signals from out of the sky
At the other end sits a ham with a smile
Who takes out his key points and cleans with a file.
He watches his clock like a cat does a mouse
To be clear of the concert which fills every house
He daren't touch his key till that concert is o'er
Else soon he would hear from the person next door.

Not many people these days file their key points, but otherwise such thoughts could have been penned yesterday rather than when they actually first appeared almost 60 years ago in the RSGB's *T & R Bulletin* of December 1925. Broadcast interference (BCI) was then every bit as much of a problem as RFI is today: most broadcast receivers were "wide-open" straight receivers as vulnerable as a modern CMOS device. Even when a dozen years later I first ventured on 1.7 MHz telephony (yes, the band did extend down to 1.720MHz!) I soon discovered that numbers of radio listeners in the town were still using straight receivers and had no wish to listen to my dulcet tones!

Television interference in the London area, due primarily to third-harmonic radiation of 14MHz transmitters, began to make an impact within weeks of the opening of the Alexandra Palace service in 1936, and has never really gone away since, though no longer the major preoccupation of British amateurs since broadcasters moved up to UHF.

But now, in the eighties, we face a host of new RFI/EMC problems as a result of the dramatic increase in the use of electronics in the home. *TT* has repeatedly drawn attention to the VCR, cable TV, home-computer, microprocessor-control, car-electronics problem, smoke detector problem... and so on and on. Many devices, of course, are two-way menaces, sensitive to RF fields yet gushing out their own pollution.

Fortunately, it is recognized in the UK that, provided the amateur transmitting equipment is "clean" of spurii, no legal blame attaches to the radio amateur and, at least in theory, the onus is not upon him to solve the problem. But in the real world in which we live the neighbours are unlikely to be swayed by legal niceties: if an amateur transmitter interferes with their equipment then, *ipso facto,* the amateur is to blame and some will do their utmost to close him down. These "social pressures" cannot be ignored: the important thing is to get somebody working on the problem before relations with the neighbour have deteriorated too far. Though I am not one of those who believe that you should go out of your way to tell neighbours that you are operating a transmitter and actually *ask* if you are causing interference!

ETI — ELECTRONIC TELEPHONE INTERFERENCE

The trend of semiconductor development seems inevitably to result in ever more vulnerable devices and equipment: very-large-scale integration is being accompanied by lower operating voltages and higher-speed operation: IV CMOS-type devices containing hundreds of thousands of FETs are on the horizon. More and more LSI devices are finding their way into consumer appliances of all types.

A few years ago I noted (*TT* January 1981, p46) the work aimed at the development of telephone microphones that would give better quality than the traditional carbon-granule inserts as used for so many years in telephone handsets. Unfortunately the electret and plastic-film transducers that have emerged from this work provide much less output than the carbon units and need preamplifiers to bring the output to a level where the new style of unit can replace directly the carbon inserts.

Electronic inserts are now gradually coming into use, although so far on a relatively limited scale. The telephone service is being improved by them but consider the results on amateur radio, as recently reported by Mike Grierson, G3TSO. He writes:

"Following a QTH move early last summer yet another source of annoyance came to light: RF breakthrough on the neighbour's telephone! While this problem had been encountered to a lesser degree before, it was then usually associated only with the earpiece and thus objectionable only close to the transmitter end. This time Donald Duck was heard at both ends of the line. Listening on 3.5MHz suggests that other amateurs are running into this problem and may be interested to learn how a cure was effected here.

"Tests with my own telephone, one of the recently-introduced 'Statesman' units, revealed audible pick-up on all amateur HF bands from 1.8 to 28MHz. After several telephone calls to British Telecom, including the Interference Department, an engineer arrived with a handful of capacitors, none of which was suitable for RF suppression.

"However, the telephone engineer proved very helpful, although clearly he had had little previous experience of RF-suppression work. Attempts were made to suppress the interference using various forms of decoupling. The new-style telephone uses an electret microphone and has a small IC preamplifier inside the handset. There is, needless to say, no screening anywhere. Several different models of this type were tried; all suffered from RFI, whereas a traditional carbon-granule insert was free of problems.

"As an experiment an electronic telephone was connected to a DC PSU, with no telephone line attached, yet RF still got in — the microphone lead seemingly the most likely cause of pick-up.

"By accident or serendipity, a cure was found suddenly. Across the microphone input to the body of the phone is a series resistor and capacitor. Simply short-circuiting the resistor resulted in immediate disappearance of the RFI with no apparent adverse effect on the operation of the telephone. While this may not appear a highly scientific solution, it does work — and a similar cure has been effective on the neighbour's telephone.

"There are an increasing number of electronic telephones, both proprietrary and supplied by BT. It is also becoming common practice for BT engineers to replace carbon inserts in older installations with the electret microphone/amplifier type of insert, each of which could spell trouble for local radio amateurs. While the BT Interference Department assured me that there were effective RFI suppression kits available, the local telephone engineers had not heard of them, nor did they even have a circuit diagram of the new-style telephones."

Typical of the miniature amplifiers now being put into telephone inserts for use with electret transducers is a Ferranti range ZN470E, ZN472E etc. Some devices feature an on-chip diode bridge that, when powered from the telephone line, operate from a dual-polarity source, although alternative devices, ZN475E and ZN478E, operate from a single-polarity supply. With the ZN478E particular care has to be taken in observing the correct line connections. The amplifiers derive their power from the line, drawing currents from 1 to 100mA. The 470 and 472 are 14-pin packages with a programmable gain of 20 to 26dB selectable in four steps. They have a high input impedance that matches directly with electret transducers without the need for a FET buffer (but presumably making them more vulnerable to RFI). Four of the other devices are in eight-pin dip packages and have 50dB maximum gain, which can be adjusted with an external resistor to suit the sensitivity of a variety of transducers. The 477 and 478 are designed for use with low-impedance tranducers, such as electret microphones with built-in impedance-matching FET buffers, intended directly to replace carbon-granule transducers in telephone handsets. The 476 is for use with moving-coil microphones or other low-impedance tranducers.

So it would seem that radio amateurs are faced with yet another RFI problem and are liable to encounter a wide variety of different telephone handsets, virtually all vulnerable to strong RF fields.

NOT SO PASSIVE DIODES

The "rusty-bolt" effect, where a poor metallic connection acts as a diode and, when subjected to RF fields, becomes a prolific source of harmonics, has long been recognized as a potential source of harmonic-type TVI. Fortunately for British amateurs, the UHF TV system tends to be less susceptible to harmonics, at least from HF transmitters.

It is, however, not always recognized that diodes in *unpowered* equipment, for example those used in antenna changeover switching, can similarly generate harmonics when the rig concerned is not even switched on. In *QST* (December 1983, pp49-50) Robert Findlay, W6NZX, describes how he found that TVI on VHF channels, when using his 14 MHz transmitter, was originating from his solidstate 144MHz transceiver which had its antenna about 1 metre above his 14MHz array. Once he had located the source of the harmonics, he tried several different 144MHz transceivers. There was TVI no matter which of them was connected to the

VHF antenna. On the other hand there was no TVI when he connected a commercial VHF equipment which had a relay-switched antenna changeover system. Clearly, the prime generator of the harmonics was the diode-type transmit-receive switching in the amateur transceivers.

He was able to cure the TVI by fitting a cirulator on his VHF rig, though he notes that for most amateurs a cheaper solution would be simply to move the HF and VHF antennas farther apart.

It should be remembered that an unpowered transistor is, in effect, two diodes formed by the junctions. Virtually any semiconductor device in dead equipment can generate harmonics if subjected to a strong RF field. This can be made use of to detect the presence of those micro-miniature eavesdropping "bugs" so often featured by the media. A little "clean" RF is "swept" across likely hiding places, and the presence of the bug detected by the appearance of harmonic signals — or so I read.

CABLE TELEVISION

Cable TV has been a real problem in Canada and the USA — now it seems Britain is about to share the troubles caused by this form of electronic technology when profit crazy entrepreneurs get their hands on, what would otherwise be, an excellent method of effectively doubling the electromagnetic spectrum.

According to the Department of Trade and Industry, the Cable TV system in Milton Keynes was switched off on 12 March. It was causing strong interference to amateurs on the 144MHz band. We understand that an alternative distribution frequency, which does not affect the 144MHz amateur band, is now in use.

CABLE FIGHTS BACK

During February the Society contacted all its members in Milton Keynes in order to survey the extent to which radiation from the cable TV system was affecting the 144MHz band and to establish the scale of the problem. The Society has also written to the local MP and had meetings with the DTi in an effort to resolve the problem — we hope to have some news of progress in this area soon. Meanwhile, in the USA the national lobbying group for the cable TV industry, the National Cable TV Association, has asked the Federal Communications Commission to dismiss the ARRL petition to ban cable companies from using frequencies which are within the amateur bands. An NTVCA representative has said that the claims that the industry has failed to take proper action to eliminate leakage are "...uninformed and unfounded". However, ARRL has said that it intends to pursue the matter; it notes that many cases of leakage from cable TV systems remain unresolved.

AR

WICEN NEWS

Ron Henderson VK1RH,
FEDERAL WICEN CO-ORDINATOR
171 Kingsford Smith Drive, Melba, ACT. 2615.

WICEN FREQUENCIES

BACKGROUND

In my 1984 annual report to the Federal Council I advised that WICEN frequencies would require review this year. Some years ago a series of WICEN net frequencies were defined, generally falling on crystal calibrator points. Over the years these have been added to and renamed WICEN calling frequencies. Their purpose has changed from being the fixed net frequency to being a calling frequency on which to establish communications before perhaps moving to one or more working frequencies on adjacent clear channels. Other considerations have been the need to be in the novice band segments to allow their involvement in WICEN and also near the "Gentleman's Agreement" boundaries of wide and narrow band modes to allow QSYs up for phone and down for CW for secondary frequencies. The introduction of international 20 metre beacons, the production of a Policy Statement on Narrow Band Modes and the frequent use by novices (and others) of calibrator spot frequencies as general net frequencies has occasioned this current review.

The 1984 Federal Convention saw merit also in reviewing the NZART practice of locating Amateur Radio Emergency Corps (AREC) frequencies near band edges and assessing its application to the Australian scene.

THE NEED

The need has not changed greatly, WICEN still requires defined calling frequencies, easily found, in novice band segments and clear of troublesome interference. With digital readouts amateurs do not now need to rely so heavily upon crystal calibrator spot frequencies and the need to be adjacent to both narrow and wide band mode band segments is not so pressing as most nets are conducted on SSB with the occasional recourse to RTTY or CW. In real emergencies (as distinct from exercises where RTTY nets are preplanned and advised), recourse to RTTY or CW on the "SSB" frequencies would be acceptable.

FREQUENCY BANDS

Examining each frequency band in turn the following comments and recommendations are made:

160 Metres. No declared WICEN calling frequency has been advised and no requirement is foreseen. Should this band be used it is narrow enough and sufficiently underpopulated to allow the normal Gentleman's Agreement to suffice. AREC operate in the interval 1.875-1.900 MHz.

80 Metres. The existing calling frequency is 3.600 MHz, an easily found spot frequency inside the novice sub-band. It is not subject to any known beacon or non-amateur interference and need not be changed. AREC operate on 3.500 MHz and 3.900 MHz USB. Use of either of these frequencies in Australia would create difficulties for neither is in the novice sub-band, the lower band edge frequency contravenes the Gentleman's Agreement and the upper is not within our amateur allocation. A change to 3.700 MHz LSB still has limitations for novices.

40 Metres. The existing calling frequency is 7.050 MHz which was situated between the narrow and wide band Gentleman's Agreement. With the extension of the band to 7.300 MHz, albeit on a shared basis, and the increasing use of RTTY between 7.040 and 7.060 MHz there is a case to go up in frequency yet remain within the exclusive amateur segment of the band. Intruders operate on 7.100 and 7.095 MHz so these should be avoided in favour of a spot about 7.085 MHz. In NZ the emergency frequency is 7.100 MHz.

30 Metres. Following the 1982 Convention I proposed through the AR column that WICEN adopt 10.115 MHz, on the Gentleman's Agreement boundary, as the calling frequency. With the interval 10.140-10.150 MHz advised for narrow band modes this selection remains satisfactory.

20 Metres. The existing calling frequency is 14.100 MHz, it now falls inside the narrow mode segment (14.070-14.110 MHz) and it is on the international beacon frequency. The VK8 cyclone watch net have experienced problems with this frequency and have tried the alternative 14.125 MHz. If their experience shows this to be usable I suggest we adopt it as the 20 metre calling frequency.

15 Metres. The existing calling frequency is 21.190 MHz, selected to be in the novice SSB segment of the band. No difficulties have been advised with this frequency so its continued use is recommended.

10 Metres. The existing calling frequency is 28.450 MHz, selected to be in the novice SSB segment of the band and on a spot frequency occurring in many converted channelised CB transceivers. Again no difficulties have been advised so its continued use is recommended.

Other WARC Bands. For these bands WICEN calling frequencies need to be declared. At 17 metres the band extends from 18.068 to 18.168 MHz, with a narrow band segment from 18.100 to 18.110 MHz and CW only by Gentleman's Agreement below 18.100 MHz. Hence a WICEN calling frequency of 18.150 MHz appears suitable. At 12m the band extends from 24.890 to 24.990 MHz, with a narrow band segment from 24.920 to 24.930 MHz and CW only by Gentleman's Agreement below 24.920 MHz. Hence a WICEN calling frequency of 24.950 MHz appears suitable.

6 Metres. This is not a crowded band so WICEN can conveniently use primary calling frequencies, having due regard for the 50-52 MHz interval. If repeaters exist in the area of operations and their use will aid communications they should be employed for the duration of the exercise or emergency.

2 Metres. In addition to the national FM simplex frequency of 146.5 MHz, repeater channels are allocated in the band plan for WICEN. Of course existing repeaters can also be used where they will aid communications.

70cm. As for 2m a national FM simplex calling frequency of 439.000 MHz has been band planned, together with WICEN repeaters on 438.625 MHz.

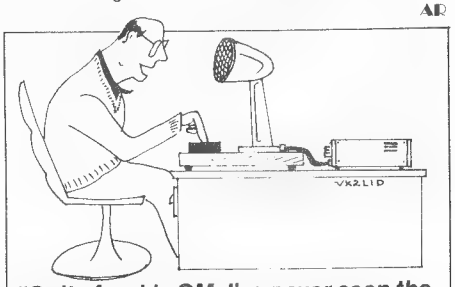
Frequency Sharing. It should be made clear to all that WICEN does not demand or expect exclusive frequencies, nor does WICEN condone or accept "frequency policemen" clearing channels. What WICEN does expect and must be provided by regulation is interference free channels for emergencies and priority use of shared facilities eg repeaters in such circumstances. For exercises and training WICEN is willing and indeed must share the spectrum with all other users, hence the duplication of some facilities (eg repeaters) to meet these needs.

CONCLUSIONS.

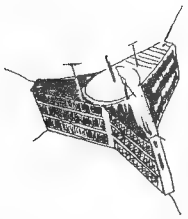
WICEN calling frequencies have been reviewed and some changes proposed in some HF bands. Calling frequencies have also been proposed in the WARC bands.

Unless major objections to these proposals are received they will be sent to the 1985 Federal Convention for ratification. However I am sure the editor will publish any short well reasoned letters both in support of and in disagreement with these proposals.

AR



"Quite frankly OM, I've never seen the need for a Speech Processor" –VK2EBM



AMSAT AUSTRALIA

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control: VK5AGR
Amateur Checkin: 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Winter: 3.680 MHz Summer: 7.064 MHz
AMSAT PACIFIC
Control: JA1ANG
1100 UTC Sunday
14.305 MHz
AMSAT SW PACIFIC
Control: W6CG
2200 UTC Saturday
28.878 MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included in some WIA Divisional Broadcasts.

ACKNOWLEDGEMENTS
Contributions this month have been received from Bob VK3ZBB, Graham VK5AGR and special thanks to ASR (Amateur Satellite Report) and AMSAT Telemail for excerpts.

OSCAR 10 REVISED SCHEDULE

The following bulletin is courtesy of AMSAT Telemail.

AO-10 Schedule Overhaul Tied To Eclipses, Service Upgrade

In the first major overhaul of three AO-10 operating schedule since the satellite transponders were first placed in service 6 Aug 83, AMSAT technical planners have revealed plans for significant improvements.

The improvements affect the General Beacon and both Mode L and Mode B transponders. The revisions are expected to be implemented in early August. Improvement in the General Beacon involves upgrades in schedule, content and currency while the transponder operating schedule will be thoroughly revised.

According to Engineering Vice President Jan King, W3GEY, the changes are an effort to respond to a number of complex scenarios including the onset of a major eclipse season, the longest seen by AO-10 to date, beginning in early September. Other factors contributing to the overall plan included the strong desire to improve the usefulness of the beacon, communicate more and varied data on it, accommodate Mode L users and encourage further inroads there. W3GEY pointed out that these, and other objectives have to be accomplished within "some rather stringent engineering constraints." The plan to upgrade AO-10 service comes as one of a series of major decisions to come from a meeting of distinguished technical leaders who met recently in England.

Details of the AO-10 planned improvements are as described below. (W3GEY cautions that a bit of fine-tuning and tweaking will be necessary pending the result of sun-angle studies.)

Beginning in August the General Beacon (145.810 MHz) will begin a round-robin programme of CW, RTTY and PSK telemetry designed to provide virtually all key system operating conditions consistent with listeners' station sophistication. The more complex your station, the more information will be available to you. The operating schedule will be as follows:

0-5 minutes past the hour	CW
5-15 minutes past the hour	PSK
15-20 minutes past the hour	RTTY
30-35 minutes past the hour	CW
35-45 minutes past the hour	PSK
45-50 minutes past the hour	RTTY
50-60 minutes past the hour	PSK

CW transmission speed will be about the same as the present. The RTTY format will be 50 Baud, 170 Hz shift.

The PSK telemetry will be the same as has always been used (400 Baud). W3GEY says a serious effort will be made to make information and perhaps hardware available for stations that wish to copy the PSK telemetry. A computer will be required and a substantial homebrew software development effort may be required to develop the interface. The format of the CW message will be a simple two-part standard: header and text. The header will be composed of 4 elements:

1 AGC level
2 MA (Mean Anomaly in units of 1 256 orbit)
3 Message serial number
4 Spacecraft identifier, ie, AO-10.

The header will be followed by a text message of varying content. The entire message, header and text, will be enveloped by the 5 minute limit. The RTTY format will contain all of the CW bulletin information. In addition, however, it will also contain the telemetry "Y-blocks" which reveal much about the AO-10 operating conditions. The values are expressed in standard engineering units. For example, milliamps, volts, degrees, etc. The PSK format may be tweaked a bit but there are no details yet available on the nature or magnitude of PSK telemetry changes. W3GEY indicates that specific user-oriented features will be included as operator aids. Such features would logically include Keplerian elements for AO-10, he suggests. Suggestions as to what other operating aids might be included are solicited. Suggestions may be forwarded to AMSAT HQ.

Plans for the new transponder schedule, according to King, had to account for seasonal changes in sun angle as well the eclipses. These factors drive the overall spacecraft attitude calculations which in turn dictate transponder schedule. Also figured in are the interesting and complex relations between power consumption (Mode L consumes much less that Mode B because of its lower than expected sensitivity) and antenna beam pattern. The Mode B pattern is much more tolerant of off-pointing than is the Mode L system. King explained that formerly the bore-sight angle of the satellite was zero (dead-on) when the satellite was at apogee. Now, however, the sun angle dictates off-pointing at apogee. The solar cells produce most power when the sun is normal (perpendicular to) the plane of the solar panels.

With the changing seasons, the angle must be adjusted. Above all of course, the power budget must remain positive. That means that for a given period of time (measured in time scales of an orbit or two) the available battery energy must be non-negative. Since recoverable battery power is less than what you put into it (there is always some loss to heat and other subtle effects) the batteries must see a net positive influx of energy on the time scales depicted. W3GEY points out that Mode B is a strong consumer of power, Mode L can be viewed as a low power mode analagous to Mode C on AO-7 and that off-times should be scheduled to maximize energy capture and storage. The plan/schedule which results is shown below. King advises that some fine tuning will be necessary but that the overall scheme of things will be as depicted.

OSCAR 10 SCHEDULE

Mean Anomaly	Time (Minutes)	Mode (O=Off)	Remarks
000	000	B	Perigee; reference time starts
089	243	B	End Mode B
090	246	L	Mode L on for 16 MA ticks 44 min.
106	290	L	End Mode L
107	292	B	Start Mode B
128	350	B	Apogee; Mode B continues
217	593	B	End Mode B
218	596	O	Commence "off" period
234	639	O	Refer Note 2 below
235	642	B	Mode B on.
256	700	B	Perigee; Mode B continues.

Note 1.
Anomalistic period (time between sucessive perigees) is 699.536283 min. One "MA tick" is the period divided by 256, ie, 2.7325636 minutes.

Note 2.
Onset of Mode L will be subject to refinement. Exact value will be announced. Recharge time ("off period") will be 128 MA ticks after Mode L onset and be about 16 ticks long.

The General Beacon update will occur about weekly. This is made possible in part by the fact of four new command stations having been qualified recently. They are VE1SAT/VE6, KA9Q, DK1KQ and ZL1AOX. All attended a special seminar at Marburg, West Germany (Headquarters of AMSAT DL) recently. The new command stations will be taking up their duties soon.

The maximum eclipse this year will be about 75 minutes long and will occur on about 1 Oct. Next year an even more severe eclipse period will occur when, on about 15 Aug, a 90 minute eclipse is predicted. KA9Q is developing a profile of the eclipse cycles to be fed into the analysis process which determines the energy budget.

OSCAR 9 STATUS

Oscar 9 continues to operate most satisfactorily. The current schedule for Oscar 9 is:

Friday	Load UoSAT Bulletin
Saturday	Bulletin 1200 Baud Telem Digitalker.
Sunday	Bulletin 1200 Baud Telem Digitalker.
Monday	Whole-orbit radiation data
Tuesday	Check-summed Telemetry
Wednesday	CCD Image
Thursday	Whole-orbit Telemetry Data

OSCAR 11 STATUS (20th July 1984)

In recent weeks Oscar 11 has been undergoing automatic magnetorquing tests prior to boom deployment. The boom tip-mass release pyrotechnics were fired on Orbit 1909 Tuesday 10th July. Tuesday 17th July saw a brief test of the CCD Camera, and the initial results looked promising. Further tests will be conducted once the spacecraft has been stabilised.

OSCAR 10 DRIFTS SOUTHWARD

The following extract (in part) is from ASR #80 18 June 1984.

. . ." On 9th May 1984 the Argument of Perigee of Oscar 10 passed 270 degrees. On that date the latitude of apogee equalled the orbital inclination of 25.62 degrees. Prior to 9th May the latitude of Apogee had been progressing north since launch. After 9th May the latitude of Apogee will drift slowly south. According to the Satellite Experimenters Handbook the rate of change of the Argument of Perigee is 0.277 degrees per day. That means that 325 days after 9th May (Arg perigee = 270) the apogee will occur over the equator (Arg perigee = 360). That will occur on about 29th March 1985. The latitude of Apogee will continue to drift south until approx 17th February 1986 (Arg Perigee = 90) when it will reach its maximum southern latitude of 25.62 degrees. At that time the Southern Hemisphere will enjoy the visibility of having apogee occur deep in one's own hemisphere. . . . ."

From that extract it can be readily recognised that amateurs "down under" can look forward to bigger and better views of Oscar 10 as it drifts southward.

UPS AND DOWNS

Once again thanks to Bob VK3ZBB we have the latest list of Launches and Re-entries. The general information supplied by Bob also provides interesting reading. How many amateurs have had a listen for weather satellites on the nominated frequencies.

de Colin VK5HI.

AR

Remember to mail your Remembrance Day Logs

SATELLITE ACTIVITY FOR PERIOD 24 APRIL TO 28 MAY 1984

1 LAUNCHES

NUMBER	NAME	NATION	DATE OF LAUNCH	INITIAL DATA PERIOD MINS	APOGEE KM	PERIGEE KM	INCLN INCLN	REMARKS
1984 – 042A	Progress	21 USSR	MAY 7	88 7	264	193	51.6	Auto Cargo Spacecraft
043A	COSMOS	1550USSR	MAY 11	105	1025	933	83	TM, SI
044A	COSMOS	1551USSR	MAY 11	89 3	305	209	72.9	TM, S
045A	COSMOS	1552USSR	MAY 14	89.6	344	191	64.9	TM, S
046A	COSMOS	1553USSR	MAY 17	104 8	1020	977	82.9	TM, SI
047A	COSMOS	1554LSSR	MAY 19	676	19125		64.8	Space Navigation
047B	COSMOS	1555LSSR	MAY 19	676	19125		64.8	– do –
047C	COSMOS	1556USSR	MAY 19	676	19125		64.8	– do –
048A	COSMOS	1557USSR	MAY 22	89 2	276	221	82.3	TM, SI
049A	Spacenet	1 USA	MAY 23	631.5	35788	220	7.0	Launched by ESA Frequencies C and KV Band
050A	COSMOS	1558JSSR	MAY 25	89.1	318	178	67.2	TM, SI
051A	Progress	22 USSR	MAY 28	88 8	261	194	51 6	Auto Cargo Spacecraft
052A	COSMOS	1559USSR	MAY 28	115	1512	1444	74	SI
052B	COSMOS	1560USSR	MAY 28	115	1512	1444	74	SI
052C	COSMOS	1561USSR	MAY 28	115	1512	1444	74	SI
052D	COSMOS	1562USSR	MAY 28	115	1512	1444	74	SI
052E	COSMOS	1563LSSR	MAY 28	115	1512	1444	74	SI
052F	COSMOS	1564USSR	MAY 28	115	1512	1444	74	SI
052G	COSMOS	1565USSR	MAY 28	115	1512	1444	74	SI
052H	COSMOS	1566USSR	MAY 28	115	1512	1444	74	SI

SI. Scientific Instruments TM. Telemetry

COSMOS 1561 was the 1500th object to be launched into space

2 RETURNS

The following satellites decayed or were recovered during the period:–

1984 – 036A COSMOS 1548	25 May
1984 – 038A Progress 20	7 May
1984 – 040A COSMOS 1549	3 May
1984 – 042A Progress 21	26 May
1984 – 044A COSMOS 1551	23 May

Together with 40 other objects

3 GENERAL INFORMATION

1966 – 100A ATS 1 was located at 164.840°E on 13 May with an inclination of 11.346

Transmission on 136.46 and 137.35 MHz

The following satellites are in circular orbit and run near continuous beacons:–

		FREQUENCY		INCL'N
1967-034A	NNSS 30120	150 MHz	400 MHz	90.214°
1967-048A	NNSS 30130	150 MHz	400 MHz	89 627
1967-092A	NNSS 30140	150 MHz	400 MHz	89.245
1968-012A	NNSS 30180	150 MHz	400 MHz	89.989
1970-067A	NNSS 30190	150 MHz	400 MHz	90.023
1973-081A	NNSS 30200	150 MHz	400 MHz	90.1
1979-057A	NOAA 6	136.770	137.770	98.556
1981-059A	NOAA 7	136.770	137.770	99.046
1983-022A	NOAA 8	136.770	137.770	98.709

OSCAR–10 APOGEES SEPTEMBER 1984

DATE	DAY #	ORBIT #	APOGEE UTC HHMM:SS	SATELLITE CO-ORDINATES LAT DEG	LON DEG	BEAM BEARINGS SYDNEY AZ DEG	EL DEG	ADELAIDE AZ DEG	EL DEG	PERTH AZ DEG	EL DEG
1	245	918	1706:34	21	292					313	11
2	246	920	1625:39	21	282			304	1	321	17
3	247	922	1544:45	21	273	302	–1	311	7	329	22
4	248	924	1503:52	21	263	308	6	318	13	338	26
5	249	926	1422:59	21	254	315	12	326	18	349	28
6	250	928	1342:04	21	245	323	17	335	22	359	29
7	251	930	1301:10	21	235	331	21	345	25	10	29
8	252	932	1220:17	21	226	341	25	355	26	21	26
9	253	934	1139:23	21	216	351	27	6	26	30	23
10	254	936	1058:30	21	207	2	28	16	25	39	18
11	255	938	1017:35	21	198	13	27	26	22	47	12
12	256	940	0936:42	21	188	23	24	35	18	53	6
13	257	942	0855:47	21	179	32	20	43	13	59	–0
14	258	944	0814:55	21	169	41	16	50	7		
15	259	946	0734:00	20	160	48	10	57	1		
16	260	948	0653:08	20	151	55	4				
17	261	950	0612:13	20	141	61	–3				
18	262	953	1710:52	20	307					302	2
19	263	955	1629:57	20	298					308	8
20	264	957	1549:05	20	288			300	–3	315	14
21	265	959	1508:10	20	279			306	4	322	20
22	266	961	1427:18	20	270	303	2	312	10	331	25
23	267	963	1346:23	20	260	310	9	320	16	341	28
24	268	965	1305:29	20	251	317	15	328	21	352	30
25	269	967	1224:37	20	242	325	20	337	24	3	31
26	270	969	1143:42	20	232	334	24	348	27	14	30
27	271	971	1102:50	19	223	344	27	358	28	25	27
28	272	973	1021:55	19	213	355	29	9	28	34	23
29	273	975	0941:00	19	204	6	29	20	26	43	18
30	274	977	0900:08	19	195	16	27	30	22	50	12

BALLARAT HAMVENTION '84

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VHF UHF - an expanding world

Eric Jamieson, VK5LP
1 Quinns Road, Forreston, SA 5233

All times are Universal Co-ordinated and indicated as UTC.

AMATEUR BANDS BEACONS

Freq	Call Sign	Location
50.005	H44HIR	Honiara
50.008	JA2IGY	Mie
50.020	GB3SIX	Anglesey
50.075	VS6SIX	Hong Kong
50.109	JD1YAA	Japan (1)
50.945	ZS1SIX	South Africa
51.020	ZL1UHF	Mount Climie
52 033	P29SIX	New Guinea
52.150	VK0CK	Macquarie Island
52.200	VK8VF	Darwin
52.250	ZL2VHM	Manawatu
52.300	VK6RTV	Perth
52.310	ZL3MHF	Hornby
52.320	VK6RTT	Carnarvon
52.325	VK2RHV	Newcastle
52.350	VK6RTU	Kalgoorlie
52.370	VK7RST	Hobart
52.420	VK2RSY	Sydney
52.490	ZL2SIX	Blenheim
52.510	ZL2MHF	Upper Hutt
144.019	VK6RBS	Busselton
144.420	VK2RSY	Sydney
144.465	VK6RTW	Albany
144.480	VK8VF	Darwin
144.550	VK5RSE	Mount Gambier
144.600	VK6RTT	Carnarvon
145.000	VK6RTV	Perth
147.400	VK2RCW	Sydney
432.057	VK6RBS	Busselton
432.410	VK6RTT	Carnarvon
432.420	VK2RSY	Sydney
432.425	VK3RMB	Ballarat
432.440	VK4RBB	Brisbane
1296.171	VK6RBS	Busselton

(1) JD1YAA is a beacon which used to operate some years ago, and was reported as being heard for four hours on 2/4/84 by Cliff ZL1MQ. (Break In, June 1984), and it seems it might well be included in the above list for the time being.

PACIFIC AREA ACTIVITY

Although a bit dated it is of interest to read in June Break In of the high degree of across the Pacific activity particularly from ZL during the early part of April, a period which saw some very good contacts by VK stations too.

Cliff ZL1MQ noted that *"1 April: ZL1AKW worked WA5IYX, VK2 worked YB1. FO8JT heard ZL stations after TV. ZL3ADT worked JA.*

"2 April: FK0AQ worked ZL3ADT, FK8EB worked ZL1, 2, ZL4LT worked T32AB and VK. ZL3ADT then added to his log T32AB, FK8EM, ZK2RS, VK and JA. ZL2AQR and ZL2TPY reported JA were in for five hours. ZL1ADP worked JY8RG. JD1YAA beacon heard for four hours on 50.109 MHz.

3 April: ZK2RF worked ZL3TIC, ZL3ADT and 44 JA stations. ZL2AQR worked T23AB, YJ8RG, ZL3-4, ten JA and fifteen VK. FK8EB to ZL1, 2, 3. and ZL1, 2, 3 and 4 worked VK2, 3, 4 and 5. ZL7OY worked 30 JA and T32AB. ZL2TPY worked YJ8RG, ZK2RD and JA.

"4 April: WB7OHF worked ZL1ADP and ZL1BHV. ZL7OY worked N5TX, WA5IYX, W5VY, K5GE and 80 JA. KH6IAA worked ZL2AQR and ZL2TPY on 51 MHz.

"5 April: FK8AX, FK8EM and JA to ZL1. ZL8AFH worked FK8 again.

"7 April: ZL7OY on 50 MHz worked ZL8AFH, W5, 6, 7, 8, XW1GE, KH6IAA, JA and TG9NX. ZL8AFH added W, JA, and YS1ECB to his list. ZL1MQ worked W5VY, WA5IYX, XE1GE and JA. WB8VYK worked ZL1, 2 and 8. YJ8RG and FK8EM worked ZL1 and 2.

"8 April: W6XJ worked ZL3NE/1, ZL1YOP and ZL3ADT. ZL1MQ to WA7YWM.

"9 April: ZL8AFH worked W6. ZL7OY worked ZL8AFH and 20 W stations. ZL2AQR worked W5FF. ZL1BHV worked 12 W and 29 JA stations. ZL1MQ worked K6HCP and 12 JA. ZL1TOP worked W6 on 51 MHz.

"10 April: ZL1BHV worked YS1ECB.

"28 April: WA6BYA worked ZL2AQR, ZL2KT and ZL2TPY on 51 MHz.

"When TG9NX and YS1ECB first came through on 50 MHz for a new country TV had gone back to 8.00 and 9.00 am start Saturday and Sunday so no ZL mainland contacts although at one stage they were S9."

All the above continues to emphasise there are plenty of exotic stations around if conditions are favourable and you are operating. What is also interesting is the wide area covered by the available signals, from W5, TG9 and YS1 through to JA and VK. Quite probably it was a case of W and the more eastern areas first, followed a bit later in the morning with JA and VK. Also of interest the fact that some contacts are being made on 51 MHz.

24 GHz RECORD

From June 1984 "Break In" comes news of a new record for New Zealand on the 24 GHz band. It was between Tony ZL1BHX and Russel ZL1BQK on 7th April 1984, at 1543 UTC, over a distance of 33km.

Equipment used were 25mW Gunnplexers into 17dB gain horns and 30 MHz homebrew (DJ7OO) designed IF's.

First contact was from Ahipara Lookout to Hakatere Forestry Observation Post. Once contact had been established ZL1BHX moved up the beach but after the distance was extended further the salt-spray haze increased and copy was in and out quite rapidly, so they decided to quit whilst ahead. They therefore concluded the 24 GHz band has quite a few secrets to reveal!

Congratulations from VK to the operators for a job well done.

TWO METRE STANDINGS

All you people out there didn't really get too excited about having your name included in a list of areas/countries worked on two metres. Apart from my own the only other entrant was from Steve VK4ZSH who has done very well on the two metre band and may be hard to beat.

Steve VK4ZSH, has worked and confirmed on two metres the following: VK1, 2, 3, 4, 5, 6, 7, 8, ZL3AFN, JA7OXL which totals 10. In addition he has worked P29ZWW on 13 12/79 but so far has been unable to obtain a QSL. For interest, his call areas overseas worked are JA1, 2, 3, 4, 5, 6, 7, 9, 0, ZL1, 2 and 3. Not a bad effort!

Steve's more distant VK contacts included VK6GU at Wyndham, VK7OO, and VK4KAZ/8 portable for the elusive VK8 contact.

To support the move to have a two metre listings, I submit the VK5LP list which has confirmed contacts with VK1, 2, 3, 4, 5, 6, 7. The oft repeated elusive VK8 contact still eludes me, as do those to ZL, but VK5 to ZL has been done, by Hughie VK5BC many years ago to establish a record.

I know there are a number of other operators who also need only a VK8, and there are a number on the eastern seaboard who can also lay claim to some other outside of Australia call areas. Hopefully, this start to a listing will bring a bit more interest for the next listing in March 1985.

DEADLINES: Copy for the next Six Metre Listings in February 1985 will need to be on my desk by 15th December 1984, and for Two Metres by 15th January 1985 for the March listing. Details of what information is required has been included in several recent back issues of "Amateur Radio." A simple listing of call signs worked for either band is not acceptable. Go to it!

MOONBOUNCE REPORT

From "The Propagator" it is noted that further optimisation of the signal to noise performance of the GAT6 preamplifier has resulted in echoes some 3 to 5dB above noise, but improvement is still possible.

Tests on 6/5 84 resulted in an EME contact with K2UYH (on 1296 MHz) and WA8NLC heard but not strong enough for a contact. VE7BBG was also worked, while ZL3AAD heard VK2AMW but no contact resulted.

The microcomputer controlled dish pointing readout system has been just about completed as a University student project, and will provide local hour angle and declination of the moon as screen readout and hard-copy printout at any selected time.

A scheduled EME test was carried out on 24/6/84 under ideal weather conditions with the moon visible throughout the test period. VK2AMW was scheduled for three half-hour test periods between 0200 and 0330 with SM6CKU, HB9M and F6EZA but the only one heard was HB9M calling at about 0330 just as the moon was setting and too low for a possible contact.

As a side issue, Lyle VK2ALU the EME project co-ordinator would like to hear from any readers who have had recent success in working through OSCAR 10 with regard to antennas used and the results obtained.

THE LOCAL SCENE

Bob VK5ZRO has confirmed what I have found, that 6 and 2 metres has been particularly quiet this month. Of course it has been a very bleak cold period too, one of the coldest for some time, with a few snow falls, quite rare in VK5.

On 1296 MHz there has been some activity. VK5ZRO and Syd VK5ME have been running regular tests using 1 watt both ways, Syd with a 1.2 metre dish and Alford slot aerial, and Bob a 27 element loop yagi. The 48 km path provides signals well over S9, in fact to carry out some antenna adjustments it was necessary to reduce power to 10mW to get the meter reading down to S9!

On 15/7 at 1040 they tried 1296 MHz RTTY 75 Baudot and signals were 599. Dick VK5ARZ is also on the band and can be read satisfactorily at VK5ZRO despite using 12.2 metres of RG8 to a 4 element beam! Steve VK5AIM and Ken VK5KEN are continuing their experiments on the band with varactor triplers.

On 6 metres Channel 0 probably from Brisbane (being the optimum distance) comes in with fairly strong bursts frequently most days. On 15/7 the bursts led to something better in the form of quite a good Es opening from 0330 to around 0450 with VK4ZWB, VK4LE and VK4ALM being available at S9 and during the latter part of the opening VK2AKU came in for a while, all to VK5. It was noted that the VK4 stations were also working into VK3.

About the only 432 MHz activity to report is the continuing contacts almost nightly between VK5ZRO at Elizabeth and Don VK5ZRG at Whyalla. Signals vary from 5 x 3 to 5 x 9 + depending on conditions, but like the VK5RSE beacon in Mount Gambier, the signals are always there!

VK5ZRO continues to spend quite a lot of time on OSCAR 10, and recent contracts have been with VE1BB, FO0FB (French Polynesia), KA2BBD (New York) and W1HMS, plus renewals to 4X4, DL1, and KX6OD/MM near the Marshall Islands. His longest contacts have been to VE1 and to TU2IE on the Ivory Coast, West Africa.

Another notable contact recently was with W6IFW who patched him through to NG84O, the station of the Olympic Village in Los Angeles. Well done!

STOP PRESS

Confirmation has just been received that at 0035 UTC

on the 24th June, Chip N6CA and KH6HME made contact on 1296MHz CW. The distance is 3977 kilometres (2472 miles) and is a new non-EME distance record.

The previous record held by VK6KZ and VK5MC was 2290 kilometres.

GENERAL NEWS

Congratulations to Wally VK6KZ for again winning the Ross Hull Memorial Contest, with 115,234 points for the 7 day section, and 35,140 for the two day section. Wally operated on seven bands to achieve this total, and it takes a lot of effort and dedication to do this on a continuing basis. Les VK3ZBJ was runner up with 99,840 and 31,336 points respectively, also achieved with multi-band operation. Other stations over 36,000 points were VK3ZHP 91,742 and 28,777; VK3YV 46,458 and 15,612 and VK6HK 36,638 and 12,474.

From comments being fed back to me it seems more VHF operators are finding they are now involved in TVI complaints, whether they are causing it or not. The widespread use of video recorders permanently connected into the aerial line are not helping, as most have a pre-amplifier and being a broadband device are quite happy to pick up all manner of all interfering signals.

It is quite surprising how much interference over a considerable distance can be caused by the line output stage of colour TV sets, plenty of rubbish exists right up to 30 MHz in some cases. And interference goes the other way too with the VCR causing patterns of lines on some channels if the signal level into the CTV is on the low side. I have seen instances where people have enclosed their recorders in foil in an attempt to reduce the problem!

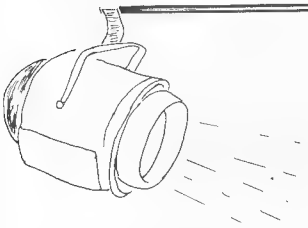
No wonder some amateurs have stones thrown on their roofs, at times with justification, but at others without. Until manufacturers are forced to adequately screen their electronic products by legislation the problem will not go away, and amateurs will have to go on making all manner of filters to try and make it easier to live with their neighbours.

There does not seem to be much else to write about this month, so we will leave some space for someone else to fill. By the time you read this the weather may be more conducive to being in the shack, and September will be the time to again keep an eye on 6 metres for long distance contacts across the Pacific. Closing with the thought for the month: *"When a man says he approves of something in principle, it means he hasn't the slightest intention of putting it into practice."*

73.

The Voice in the Hills.

AR



SPOTLIGHT ON SWLing

Robin Harwood, VK7RH
5 Helen Street, Launceston, Tas 7250

On the 2nd of September, most international broadcasting stations alter their operational frequencies to take account of seasonal fluctuations in propagational conditions. This means that we, in the Southern Hemisphere, will be hearing signals on the higher frequencies later into the local evening hours.

In Europe, daylight saving concludes on Sunday the 30th of September, which means transmissions specifically for that region, will be heard one hour later. This also means some frequency re-arrangement to cater for the listening audience. As well, the USSR also reverts to Standard Time on the 1st of October, only twenty four hours later. This traditionally is the date when Soviet Domestic and Foreign Service Networks make extensive and unco-ordinated frequency alterations. Fortunately, this year there is only a twenty four hour gap in these re-arrangements.

While we are talking of propagational anomalies, I have recently observed signals on 3.5 MHz skipping quite markedly. Normally, I can read local stations from Hobart quite clearly with full scale deflection on the S-meter, but they have been unreadable. At the same time, long distance signals have been propagating very well on the same frequencies with stations in Alaska being worked on CW at 589 as well as stateside stations on SSB on 3.797 MHz being easily worked on modest equipment and antennas in the DX "window". I find it rather ironical that I was indeed fortunate working these stations without really trying, when I especially wished to contact local stations and could not do so.

This phenomena is caused by the ionospheric layer going much higher than it normally would. The maximum usuable frequency (MUF) is also much lower, say around 10 MHz. True, there is some correlation between solar flares and auroral disturbances, yet I could not detect any visible luminance in the heavens because of reflections from the lights of Launceston, although signals from Hobart and Falmouth were quite fluttery. I seemingly recollect about 1973, during the last lowspot in the Solar Cycle, we experienced similar propagation when the ZL signals were a lot stronger than the mainland VK's or even locals.

It is no coincidence either that HF propagation is severely disturbed around the same period, particularly on East-West paths. For example, I could not hear the Radio Netherlands relay from Bonaire on 9.650 MHz at 1030 UTC in July, when they are normally quite loud. I could only detect their carrier at strength 2 with no discernable modulation. Yet Soviet FS outlets to our north were quite noticeable, particularly those broadcasting in Japanese or Chinese. Hopefully by now, these conditions will have improved, with better propagation on 14 and 21 MHz, especially to Africa.

Now for some programme news: Radio Netherlands will have two separate reports on the FIRATO 1984 audio and video consumer Fair. This is held every two years in Amsterdam, alternating with the Berlin Radio Fair. It commenced on the 29th of August for ten days and Radio Netherlands had a non-technical look at FIRATO 1984 on "REPORT" on Friday the 31st of August, while a technical survey of what was available at the Fair, will be on Media Network on September 6th at 0750 or 1050.

Talking of Media Network, RN's weekly communications magazine, the producers have placed this in recess until October. In the mean time, several interesting documentaries from past editions are being aired, yet it still has a five minute capsule of media developments at either the beginning or end of the programme. During its break, the producers are re-evaluating the programme's contents, and are interested in hearing listener's comments what they would be interested in hearing over Media Network.

Another DX programme has undergone alterations. Clayton Howard, who has hosted the "DX Partyline" over Radio HCJB in Quito, Ecuador for the past twenty two years, retired at the end of June and has returned to the United States. The programme has continued with new host, John Beck. It is heard on 6.130 MHz at 0930 UTC Mondays and Saturdays and repeated on 21.477.5 MHz at 2130 UTC on the same day. Our own Radio Australia DX programme, "Talkback" with Barry Seeber, now has an amateur segment every month. It is best heard at either 0530 on 17.820 MHz or 0810 on 6.040 MHz on Sundays.

In June, we witnessed the fortieth anniversary of the D-Day landings in France. In September, the Netherlands will remember another famous World War II battle known as "Operation Market Garden". This battle was the subject of the film "A Bridge Too Far". "REPORT" will be examining the successes and failures of this operation, which indirectly halted the liberation of the Netherlands until the following April. You can hear it on Monday the 17th of September at either 0750 or 1050 UTC via the RN relay at Bonaire.

In conclusion, I would like to acknowledge Col VK4AKX for supplying details of where I could obtain the METEO code, that I requested in the July issue of this column. For those interested, see the Admiralty List of Radio Signals Vol 3 at your local reference library. Col and I frequently work each other on the weekly Intruder Watch Net on Thursdays at 1030 UTC on approximately 3.540 MHz + QRM.

Well, that is all for this month. Until next time, the best of 73 and good listening! — Robin VK7RH. AR

"Welcome Aboard," from K8KRG on the USS Cod

"Dive! Dive! Dive!" once echoed throughout the hull of the World War II submarine *USS Cod*. Today, some 40 years later, the words "CQ CQ, K8KRG calling" echo through that same hull. Through the efforts of the Northern Ohio Amateur Radio Society (NOARS), it is possible for radio amateurs around the world to make a radio contact with this gallant WW II remnant.

The *Cod* (SS-224), one of 236 fleet-type submarines used in WW II, is permanently moored in Cleveland, Ohio, on the shore of Lake Erie, as a historical monument to the men of the "Silent Service" of WW II and submariners throughout the world.

At a Christmas banquet in 1979, WD8RZG, KA8GPW and WD8IQJ met with the directors of the Great Lakes Historical Society, which then owned the *Cod*.

The Parma RC, K8UZW, a small, local radio club, sponsored operations from the *Cod* during the summers of 1980 and 1981. Their operation was limited to using wire antennas on a few bands, but to everyone's surprise pileups became common as radio amateurs worldwide eagerly tried to contact K8UZW. Because of the limited support possible with the Parma RC, a larger sponsorship was picked up by NOARS, a general-interest club with about 700 members worldwide, which set up its club station, K8KRG, onboard the *Cod*.

During 1983, K8KRG made more than 2300 contacts from the *Cod*.

The *Cod* will be open during the Cleveland Hamfest, on 23 September. K8KRG will send a QSL card to all stations who contact the *Cod*. Also, a certificate, with the *Cod's* picture on it, is available for $1. A brochure on the *Cod's* history is enclosed with the certificate. QSL manager for all contacts is WD8RZG, 8927 Torrance Avenue, Brooklyn, OH, 44144.

abridged from QST, May 1984

AR

AWARDS

Hugh Spence, VK6FS
FEDERAL AWARDS MANAGER
44 Mosaic Street, Shelley, WA 6155

Here we are again with another deadline fast approaching and first up a DXCC Rule change passed at the Federal Convention '84.

Rule 1.2 of the Australian DXCC Award has been altered by Motion 84.13.08/1 to read as follows:– *This award, to be known as the DX Century Club Award will be issued to any Australian amateur station, a station operating in a previously Australian Administered Territory or any overseas station whose licensee is a financial member of the WIA.*" So now all ardent DX'ers will be able to amend their copy of the Rules.

News has just arrived of an exciting new award from Norway. At least I regard it as being exciting as one hundred LA/LB stations must be worked AFTER 1st January, 1984 This means all stations are on an equal footing and the "big guns" and older amateurs cannot just riffle through their QSL boxes and pull out 100 LA cards and get one of the first certificates, or even one of the "Cups" offered to the first applicants. I wonder who will be the first VK to qualify? It won't be me as I've only worked two LAs this year.

DETAILS OF THE 100 LA AWARD

1 Award issued by the Stavanger Group of the NRRL and is available to all licensed amateurs and SWLs (on a "heard" basis).
2 100 two-way contacts with 100 different LA/LB stations AFTER 1st January, 1984. (LF, LJ and LH stations do not count for award.)
3 All valid amateur bands may be used. (10, 18 and 24 MHz not available before 1/1/1989)
4 Award issued for CW, phone or mixed modes
5 A list showing full details of the contacts, confirmed by QSL-cards, should be certified by the Award Manager of the National Society.
6 Fee is 20 NOK or 10 IRCs.
7 Application must contain callsign, date, time, band, RST and Mode and be addressed to — Award Manager, Stavangergruppen av NRRL, Postboks 354, 4001 Stavanger, Norway.

VK UPDATES ETC

Now for latest details of new DXCC members, DXCC updates and new WIA certificates issued.

DXCC NEW MEMBERS

PHONE

Callsign	Cert No	Tally
VK2VSV	325	120
VK4AIX	326	149
VK5ATN	327	111
CW		
VK4AIX	124	122
OPEN		
VK2BQS	223	153
VK5ATU	224	100
VK4AIX	225	178
RTTY		
VK2EG	2	99/102

DXCC AMENDMENTS

PHONE

VK3CSR	248, 251	VK7BC	286 291
VK3KHI	171	VK5AB	314/348
VK4AK	308 318	VK2BQS	150
VK2VBL	209	VK1ZL	129
VK5OU	275 277	VK2DFE	300 304
VK6FS	298, 302	VK9NYG	160
VK6MK	314/354		
CW			
VK7BC	172/178	VK3KS	277/298
VK3XB	299 330	VK6RU	265/307
VK6FS	147/150		
OPEN			
VK7BC	302 309	VK3XB	303 334
VK4AK	311/322	VK2BQS	154
VK6FS	299 303	VK6MK	314/354

WAVKCA AWARD

Call	Cert No	Call	Cert No
JA4CQS	1243	JA4JBZ	1244
JK1PTF	1245	YB0ZM	1246
JR3ISM	1247	N5DEE	1248
JR7CDL	1249	JA3QPC	1250
JA7UVI	1251	A92P	1252
ZP5PX	1253	GW4BKG	1254
VK1ZL	1255		

WAVKCA (VHF)

VK2EEC	18		

HAVKCA (SWL)

DE0DXM	78	P Kunfus	
L313O4	79	G Vigar	

WAS (VHF)

JF2BKV	154	VK4ZSH	155

THE DX FAMILY AWARD PROGRAMME

(Sponsored by the DX Family Foundation — DXFF.)

AWARD MANAGER: Souichi Miyamoto JA3DBD, 9-2 Habikigaoka 6-chome, Habikino, OSAKA 583, JAPAN. *GENERAL RULES* 1 Applicant must submit QSL-check list certified by his National Amateur Radio Society 2 Two-way communication is obligatory. 3 Certificate is free of charge.

1 DXF "D" AWARD (DXFDA)

Work DXF Members and earn 5 points. Each symbol (DXFF) on their cards is valid for 1 point for award.

2 DXF "X" AWARD (DXFXA)

Spell "DXF" 5 times with any letter of different country prefixes eg

"D" DL2CQ JD1YAA DM2CHM D4CBS 3D6BC
"X" XE2HL XT2AW LX1AJ 5X5NK 4X4WL
"F" F6ENL FK8DD JF1SPG FW0WW FO8XB

3 DXF "F" AWARD (DXFFA)

Requires 5 different Country-contacts. Each one must be made with

(1) the station is under DXpedition sponsorship by the DXFF, (eg XU1SS, VK0HI/VK0CW, AD1S/KH5, 8Q7AV/AZ)

(2) a DX station using a special QSL sponsored by the DXFF.

4 DXF "SPECIAL" A new Award

As one of the Fifth Anniversary activities of DXFF, they began issuing the new "DXF SPECIAL AWARD" starting from 1st June, 1984. Everyone who has collected all the "D", "X" and "F" Awards can apply for the DXF "Special Award". It is free of charge Send a list of the Certificate Numbers of your "D", "X" and "F" awards to the DXF "SPECIAL" Awards Manager; *Tadahiro Kusano JH1GZV, 4-16-11 Oji, Kita, TOKYO 114 JAPAN.*

I have altered the format for listing the current DX Ladder. In presenting this list I have included the tally of our late member, VK7DK, who passed away in July. Having known Den Kelly for many years it came as a shock to hear the sad news and condolences are extended to his family.

DXCC LADDER AS AT 21-7-84.

DXCC PHONE:

314 Countries, VK6RU; VK5MS; VK6MK; VK5AB; VK4KS. *310*, VK4VC. *309*, VK6LK; VK4RF; VK6HD. *308*, VK7DK; VK4AK. *307*, VK7LZ. *306*, VK3JF. *302*, VK5WV. *300*, VK6NE; VK3AWY; VK2DFE. *299*, VK3AMK; VK3AKK; VK6FS. *297*, VK3DU. *296*, VK5WO. *295*, VK3OT. *291*, VK6YL. *290*, VK2APK; VK3RF; VK3YJ. *288*. VK6IH. *286*, VK7BC. *281*, VK2AHH. *279*, VK2BLN; VK6IR. *278*, VK6AJW. *276*, VK4BG. *275*, VK5OU.

DXCC CW; *310*, VK2QL. *306*, VK3YL. *299*, VK3XB. *292*, VK3YD. *291*, VK4RF. *280*, VK6HD. *279*, VK2APK. *277*, VK3KS.

DXCC OPEN: *314*, VK6RU; VK6MK; VK3YL; VK4KS. *313*, VK4SD. *312*, VK6HD. *311*, VK4AK. *310*, VK4RF; VK7DK. *309*, VK7LZ; VK3JF. *305*, VK5WO. *303*, VK3XB; VK5WV. *302*, VK7BC. *299*, VK3AMK; VK3AKK; VK6FS. *298*, VK3OT. *297* VK2APK. *292*, VK2SG. *287*, VK2AHH. *285*, VK3JA. *284*, VK4BG. *283*, VK3BCN.

DXCC OVERSEAS MEMBERS: *311*, WA3HUP, *291*, WB3CQN, *140*, G3NBC.

DXCC NEW MEMBERS

PHONE: VK6DU, Certificate Nr 328, Tally 114.

DXCC AMENDMENTS

CALL	PHONE	CW	OPEN
VK2PY	227		
VK3AOT	253		
VK3AWY	300 304		
VK3RF	290 295		
VK3JA			285 328
VK4BG	276 287		284/298
VK4RF		291 315	
VK5ATN	112		
VK5WO	296 320	171 176	305/334
VK6YF	181		
VK6RU		266 308	
VK6FS	299 303		299 303
VK6IR	279 282		

WA-VK-CA AWARD

CALL	CERT NR	CALL	CERT NR
JH2TPI	1256	JA6CBG	1257
JA5BLS	1258	JA7UFZ	1259
JF1IRW	1260	GM3UCI	1261
YC3CEV	1262	JA1KRU	1263
W3OG	1264	OK1TN	1265
JA8RII	1266	JR7BCO	1267

IARU REGION 1 AWARD

General

1 The award is available to licensed amateurs and SWL's.
2 Contacts after November 1945 are valid.
3 Applicants outside the UK should submit a list certified by the awards manager of an IARU member society.
4 Contacts must be made from the same call area. Contacts made during National Field Days are not valid for the award.
5 The fee for applicants outside the UK is: 50p, $1 or six IRC's.
6 The address for applications is:– *PA Miles, PO Box 73, Lichfield, Staffs. UK.*

Requirements

The award is issued in three classes.

Class 3: Confirmed contacts are required with 20 member countries.
Class 2: Confirmed contacts are required with 35 member countries.
Class 1: Confirmed contacts are required will all member countries.

Extra countries may be added to the list of IARU members from time to time and these will be announced in Radio Communications.

WORKED ZAMBIA AWARD.

General

1 The award is available to licensed amateurs and SWLs (on a heard basis)
2 Contacts with 9J2 and other prefixes in Zambia are valid.
3 Do not send QSL cards. A list giving full details of the contacts should be certified by the Awards Manager of a National Society.
4 Separate classes of the award are available – all CW, all AM, 2XSSB and mixed modes.
5 The fee for the award is $1 or seven IRC's.
6 The address for the application is:– *Awards Manager RSZ, Daniel Soko, Box 1831, Ndola, Zambia.*

Countries for IARU Region 1 Award

Algeria	Austria	Belgium	Bulgaria	Botswana
Bahrein	Cyprus	Czechoslov'a	Denmark	FR Germany
Gibralta	Faroes	Finland	France	Ghana
Greece	Hungary	Iceland	Ireland	Israel
Italy	Ivory Coast	German DR	Jordan	Kenya
Lebanon	Liberia	Luxembourg	Malta	Mauritius
Monaco	Netherlands	Nigeria	Norway	Oman
Poland	Portugal	Rhodesia	Romania	Sierra Leone
S Africa	Spain	Sweden	Switzerland	UK
USSR	Yugoslavia	Zambia		

Rules

Each 9J2 station counts as 'one' point on 7, 14, 21 and 28 MHz. Each 9J2 station counts as 'two' points on 1.8 and 3.5 MHz. Other prefixes count double points. The same station may be worked on different bands.

Requirements

Stations in CQ Magazine zones 36, 37 and 38 require 20 points. All other stations require 10 points.

"FRANCESCO DURANTE" AWARD

On the occasion of the third centenary of the birth of "Francesco Durante" (1684-1755), well known music composer born in Frattamaggiore (Napoli), the local ARI Radio Club is sponsoring a national and international HF Contest with the following rules;

PERIOD: from 00.01 1 July to 24.00 UTC 31 December, 1984.

MODES: SSB, CW, RTTY.

BANDS: 3.5, 7, 14, 21, 28 MHz.

CONTACTS: In order to qualify, amateurs shall make following types of contacts:

a) maximum number of different countries of DXCC List.

b) not less than ten contacts with different station members of Frattamaggiore ARI Radio Club.

c) contacts necessary to form the name "Francesco Durante" using the initial letter of prefixes belonging to different DXCC countries.

Each of the above contacts counts as one point:

SCORE: Total score will be the sum of points calculated as above.

PRIZES: Cup, Plate and Medal to first, second, and third classified in each mode. Diploma to all participants who have contacted ten members of Frattamaggiore ARI Radio Club at least.

LOGS: Logs showing detailed list of all contacts made as indicated above shall be sent with ten IRCs or Lira 5000 to: ARI Radio Club, PO Box 15, 80027 Frattamaggiore (Napoli), Italy — Postmarked not later than 31 January, 1985.

Members of Frattamaggiore ARI Radio Club:
IK8CVZ, IK8DGO, IK8DYB, IK8EQL, I8FTV, I8HDG, I8HFU, I8IHG, I8IKL, I8IYW, I8INW, I8JOV, I8ISX, I8KLW, I8KNT, I8KUT, I8NOF, I8QHP, I8SRP, I8VKM, I8WES, I8WY, I8YRK, I8YZP, I8XTX, I8ZTE.

The ARRL DXCC Certificate may appear to some to be a desirable possession. However, gaining this certificate can be a costly and risky business.

Consider just how much would be spent to acquire those first 100 QSL's. Then to gain the certificate, one is required to take the risk of entrusting these valuable cards to the Postal Services of at least two countries, just to get them to the ARRL. Then they have to come back again at the cost of Registered Mail.

Not only the Postal services can put our cards at risk but there are common carriers also involved to transport them by road, rail and air. Shipping could even be involved.

Here in Australia, we are fortunate in that the WIA DXCC Certificate is operated, at present, under different Rules. We have the option of (1) posting our cards to the Federal Awards Manager, (2) Having the cards checked by (a) the Awards Manager of our local Club, (b) Secretary or a Council Member of our Club or WIA Division or (c) have two fellow amateurs known to the applicant check them.

If we use option (2) or (3) then the person(s) checking our cards is/are required to sign the declaration mentioned in the General Rules for Australian Awards in the 84/85 Callbook, and in August issue of Amateur Radio page 42.

Francesco Durante

Checking the cards involves much more than just counting a bundle of cards and checking our count against the number of contacts listed as required under Rule 1.3, and then signing the declaration. The declaration was introduced into the rules to prevent any shenanigans with the DX Ladder.

The checkers are required to scrutinise the cards in the same careful manner that would be adopted by the FAM and they must look for the following points.

1 *Details as per General Rule 1.3.*

2 *Date and Time.* This is most necessary especially in the case of DX'peditions, or short term operations by people on holidays, so as to obviate bogus or counterfeit cards being presented.

3 *Type of emission.*

4 *Frequency Band,* eg If someone presented a card from a VK Novice showing the frequency as 21.295 MHz then the card would have to be rejected as the Novice station would have been out of band.

5 *The report must be checked against the mode shown.* If the report is shown as RST559 and the mode shown as SSB, then the card cannot be claimed for CW or SSB DXCC category. I would be prepared to accept it for "OPEN" as receipt of the card could be taken as proof that a contact had taken place.

6 *It is imperative that the card show the location of operation of the DX station.* eg I have, in my useless pile, a card received from a G3 QSL Manager showing three printed callsigns, one of which was inked out as was the "Sultinate of Oman" address. The calls not erased were G4CTQ and VP2KH and another callsign, 5N0SID had been written in, but nowhere on the card did it state that the station was in Nigeria at the time I contacted him. Another card from 5N0PSN showed neither location nor address. Also a card from a USA Manager bearing the callsign K5LBU/ST0 also showed no location or address. These cards are unacceptable under Rule 1.3. (General) Another unacceptable card from ZS2MI shows neither mode nor report so there was no way for me to prove whether I worked him SSB, CW or with two tin cans on a piece of string.

Some readers may consider our rules as being trite, but with the multitude of strange calls appearing these days, one cannot say that any old UK1 callsign is operating from Franz Josef unless the card definitely states this fact. Likewise KM6 and KJ6 do not indicate that the station was operating from Midway or Johnston Islands unless the card definitely states so. Many stations in California have now been allocated the KM6 and KJ6 prefix. Rule 1.4.(f) (General) should be followed if in doubt.

Not being forced into the cost and risk of sending cards to the FAM is a *PRIVILEGE* here in Australia at the present time. It is up to each and every one of us interested in DX to respect this privilege in order to prevent any unscrupulous person from gaining his DXCC to the disadvantage of the genuine DX'er.

Well that's about it for this month so 73 and good DX, Hugh.

AR

QSP

TELETRAFFIC ENGINEERING; A REVIEW

A review of Teletraffic Engineering is being published in the June and August numbers of the Telecommunication Journal. The Telecommunication Journal is the monthly periodical of the International Telecommunication Union (ITU)*.

In the editorial of the June number Mr Richard E Butler, Secretary-General of the ITU stated:

"Statistics show that the total annual investment only in telephone plant — the world's biggest automaton — is more than 25,000 million United States dollars. The resources created by these investments should be used in the most efficient way to give the best possible return. It is the application of teletraffic engineering in planning and operating networks that is responsible for such efficiency. Of course, this is not the only aspect to be emphasized, since better exploitation of resources is at the same time the provision of a better service for our human community."

Part I of this review on teletraffic engineering published in June contains the following articles:

— *Forward, by Professor Arne Jensen, Chairman, International Teletraffic Congresses;*
— *Facts on trends of telephone traffic engineering in CCITT,*
— *An approach to traffic analysis of chronicly overloaded networks,*
— *Optimum grade of service in telecommunication networks,*
— *New services and their impact on traffic engineering,*

Part II of the review on network management, to be published in August, contains the following articles:

— *Telecommunication systems and traffic theory,*
— *Teletraffic measurement,*
— *Calculation of time-varying blocking probability on the basis of measured traffic,*
— *Teletraffic training — a must,*

The June and August numbers of the Telecommunication Journal also include:

— *Reports of meetings of Study Groups and Working Parties of the Union's International Consultative Committees;*
— *News of telecommunications developments throughout the world.*

The June and August issues of the Telecommunication Journal are available at a price of 7.50 Swiss francs each from: Sales Service, International Telecommunication Union, CH-1211 Geneva 20.

A one year subscription to the Telecommunication Journal costs 90.- Swiss francs.

*The International Telecommunication Union is the United Nations specialized agency for telecommunications. It was founded in 1865 and now has 159 Member Countries. Its Headquarters in Geneva comprise four permanent organs: the General Secretariat, the International Frequency Registration Board (IFRB), the International Radio Consultative Committee (CCIR) and the International Telegraph and Telephone Consultative Committee (CCITT). AR

CONTESTS

Ian Hunt VK5QX
FEDERAL CONTEST MANAGER

P.O. Box 1234, GPO, Adelaide, SA 5001.

CONTEST CALENDAR.

September.
8-9th DARC European Phone.
15-16th VK Novice Contest. (Rules AR August)
29-30th Delta QSO Party.

October.
6-7th VK/ZL Phone Section. (Rules this issue)
13-14th VK/ZL CW Section. (Rules this issue)
It is likely that the CQ WW DX Phone Contest will be held in October, possibly the last weekend with the CW Section of that contest following in November. As soon as information is made available to me I will include same.

1983 REMEMBRANCE DAY CONTEST CERTIFICATES

Due to receipt of an enquiry for a certificate which should have been awarded for this contest I have made some investigation as to what has occurred. It appears that no certificates were made out and posted for Novice, Limited and 'K' Call holders as provided for in the rules. I am following the matter up and as soon as possible will try and have the situation rectified. So please be patient as this problem has only just become apparent.

It would also appear, from the results listed for the contest, that both VK2ZVN and VK5ZTJ were incorrectly included in the 'Open' Section in which some CW operation would normally be expected. I have asked the Federal Office to try and sort these problems out.

By the time you read this the Remembrance Day Contest will be over. I hope you had good luck in this event which is regarded to a large degree as being the most important of the contests on the Australian scene

This month I wish to broach the subject of ensuring that contests are fair and equitable. This tends to present quite a problem when the differences in population density, propagation conditions, types of operation etc. are considered. However, let me pose a few questions and then I might expect to receive a few comments from you, the reader and, I hope, contester

The current Remembrance Day Contest rules allow repeat contacts on VHF bands only provided six hours have elapsed since the previous contact was made with a specific station. I believe that I read that this is to make things more even between city and country stations. Is this really the case? Does this approach penalise the city VHF operator and discourage him from spending more time on the bands during the contest? Will this change encourage the city Full Call operator to stay away from the VHF bands and concentrate only on HF? Does this really do anything much for any of the operators, city or country, in the contest? Should we go back to the two hour rule which might allow some of the better VHF operators to keep fairly busy right throughout the contest and thus improve and display their skills to a greater degree? How about the country VHF operator who has the potential to contact no more than about ten stations from his particular location? In the one instance he can only make a total of forty contacts during the whole twenty four hours of the contest and in the other case he could probably manage 120 contacts. In the first situation he might not even bother to enter the contest.

We have the VK Novice Contest coming up. With the low sunspot numbers it could well be that little or no propagation exists on either the 10 or 15 metre bands. Under these conditions how can a VK5 or VK6 operator possibly compete with the stations in the eastern states with the much higher population density allowing so many more stations to be worked on the 80 metre band? Should there thus be several distinctly separate sections when it comes to scoring such contests on a state basis? Should a similar approach be used in scoring for the Contest Champion Trophy?

In the 1984 Field Day Contest results you can see that our Federal President VK3ADW made a total of 649 points to be placed fourth, in the six hour division as a portable field station, solo operator, transmitting phone. In the same contest VK2PWS made a total of 100 points in the same division as a portable field station, solo operator, transmitting open, and gained second place. For his efforts VK3ADW has been given seven points towards the Contest Champion Trophy whilst VK2PWS has received nine points. Let me hasten to say that I am not decrying the efforts of VK2PWS, whom I do not know anything about, neither have I seen a copy of the log entries concerned. Suffice to point out that the only difference between the two logs may well be that all of the contacts except one only made by VK2PWS were utilising 'phone', with the ONE CW Contact qualifying his log in the Open Section. Also contrast this with the log of VK5YO who made 284 points using phone in the same section as VK3ADW and gained only five Contest Champion Trophy points for a score that more than doubles that of our selected VK2 friend. Again, I reiterate that I am not intending any criticism of any of these operators, but am merely questioning the wisdom perhaps of allotting points for the Contest Champion Trophy in the manner done up until now. Should there be less sections in this Field Day Contest? What other approaches should be taken to this problem? Is it that VK2PWS deserves perhaps even more credit if most of his contacts were on CW with only the 80 metre band available to him whereas the other two operators had useful propagation on the 80, 40 and 20 metre bands as well as the use of VHF and higher power.

Harking back to a few years ago there used to be a scoring table used for determining points for each contact made in the Remembrance Day Contest. This table was an attempt to overcome some of the problems caused by distance, propagation differences, population density in particular call areas etc. Stations in VK2 and VK3 were worth less points per contact than those in VK8, for example. Should this scoring table be re-adopted? Stations in VK6 can work VK1, 2, 3, 4, 5, 7 and 8 on the 20, 15 and 10 metre bands with little difficulty and thus make a greater number of contacts with stations in these areas simply because the geometry of propagation allows this. They cannot work into those areas anywhere near as easily on the 80 and 40 metre bands. Compare this situation with the VK5 operator who can work VK2 and VK3 stations without much difficulty on 40 and 80, but whose signals just bounce right over the high density population areas on the other HF bands. It would seem from this that the VK6 operator would thus have the edge on the VK5 operator including the consideration that the 80 metre operation would most likely take place during the night when perhaps many of the stations would be closed down while the operator either goes out for the evening or goes to bed etc.

So again I suggest that you make your views known so that some consensus of opinion may be available. I would suggest that your ideas should be widely circulated so as to assist fair discussion. To this end I propose to forward your letters to the Editor for inclusion in the correspondence column. I can also assure you that I have no intention of making any drastic unilateral changes to any of the rules for any of the contests without at first allowing the opportunity for some free and widespread expression of opinion

I will just throw in one more curly one. For a number of consecutive years the VK7 Division tried to have the use of repeaters allowed in contests. They were always fairly well outvoted on this issue at the annual Federal Conventions. What do you think? Should repeater operation be allowed in contests? Could I perhaps suggest that this would be a big help to many of the country operators?

So, over to you. I really do need to know just what you think about all this otherwise I just might have to go off by myself and dream up such rules that the contest scene becomes a real mess.

Incidentally, with regard to the results published for the John Moyle Memorial Field Day Contest in the June issue of the magazine a perusal shows that Contest Championship points were allocated to multi-operator and Club station callsigns. Such stations are not eligible for points for the Contest Champion Trophy, therefore those portions of the Field Day results may be ignored.

VK/ZL/OCEANIA DX CONTEST 1984

NZART and WIA the National Amateur Radio Associations in New Zealand and Australia invite world-wide participation in this years' VK/ZL/OCEANIA DX Contest.

WHEN? PHONE 24 hours from 1000 UTC Saturday 6th October to 1000 UTC Sunday 7th October.
CW 24 hours from 1000 UTC Saturday 13th October to 1000 UTC Sunday 14th October.

RULES: 1. There shall be three main sections in the contest — *(A) Transmitting Phone (B) Transmitting CW (C) Receiving — "Phone & CW" combined.*

2. The contest is open to all licensed transmitting stations in any part of the world. No prior entry need be made. Mobile marine and other non land based stations are permitted to enter. Their "country status" will be determined by the country which issued the callsign used in the contest.

3. All amateur bands may be used but no cross band operation is permitted *Note:* VK and ZL stations irrespective of their location *do not* contact each other for contest purposes *except* on 80 and 160 metres on which bands contacts between VK and ZL stations are encouraged.

4. Phone will be used during the first weekend and CW during the second weekend. Stations entering both sections must submit separate logs.

5. Only one contact on CW and one contact on phone per band is permitted with any one station for scoring purposes.

6. Only one licensed amateur is permitted to operate any one station under the owners callsign. Should two or more operate any particular station, each will be considered a competitor and must submit a separate log under his own callsign. This is not applicable to overseas competitors operating club stations.

7. Entrants must operate within the terms of their licenses.

8 *Cyphers:* Before points can be claimed for a contact, serial numbers must be exchanged and *acknowledged.* The serial number of five or six figures will be made up of the RS (Phone) or RST (CW) report plus three figures which may begin with any number between 001 and 100 for the first contact and which will increase in value by one for each successive contact (eg) If the number chosen for the first contact is 021, then the second must be 022 followed by 023, 024 etc etc After reaching 999, restart from 001.

9. Scoring (A) *For Oceania stations other than VK/ZL* — two points for each contact on a specific band with VK/ZL stations and two points for each contact on a specific band with the rest of the world (B) *For the rest of the world other than VK/ZL* — two points for each contact on a specific band with VK/ZL stations and two points for each contact on a specific band with Oceania stations other than VK/ZL. (C) *For VK/ZL stations:* Points for each QSO on different bands as follows: 20M — 1 point; 15M — 2 pts; 10M —5 pts, 40M — 5 pts, 80M —10 Pts; 160M — 30 pts.

Score for *each band* will be the total points score for that band multiplied by the total prefixes worked on that band. Final "all band" score is the *sum* of the different band scores. *Note:* W1, K1, WA1, WN1, A1, N1 (although all in the same call area) are different prefixes and count as multipliers. W6AA/1 is same as above and counts as a "W1" and not "W6". (D) *80 metre section:* for 80 metre contacts between VK and ZL stations, each VK and ZL call area will be considered a "scoring area" with each contact counting ten points. Each different call area will count as a multiplier. (E) *160 metre section:* Contacts permissible between VK/ZL, VK/VK, ZL/ZL, as well as VK/ZL to the rest of the world. Each VK and ZL call area will count as a "scoring area" with each contact counting thirty points. Each different call area will count as a multiplier. *Note:* A contestant may claim points for contacts with other stations in the same call area for this 160 metre section.

10. LOGS: (A) *Overseas stations:* (A) Logs to show in this order — Date, Time in UTC, Callsign of Station Contacted, Band, Serial Number Sent, Serial Number Received. UNDERLINE each new VK/ZL/O call area contacted. Separate log must be submitted for each band used. (B) Summary sheet to show — Callsign, Name and Address in BLOCK LETTERS; details of equipment used; and, for EACH BAND — QSO points for that band — VK/ZL/O call areas worked on that band. *"Single Band"* score will be QSO points for that band multiplied by total VK/ZL/O call areas worked on that band. *"All Band"* score will be total QSO points for all bands multiplied by total VK/ZL/O call areas worked on all bands. (B) *VK/ZL Stations:* (A) Logs must show in this order — Date, Time in UTC, Callsign of Station Worked, Band, Serial Number Sent, Serial Number Received. USE SEPARATE LOG FOR EACH BAND. (B) Summary sheet to show — Name and Address in block letters; Callsign; for EACH BAND — QSO points for that band, prefixes worked on that band, claimed score for that band. *"All Band"* score will be total of single band scores. Give details of equipment used and declaration that all rules and regulations have been observed.

11. The right is reserved to disqualify any entrant who, during the contest, has not strictly observed regulations or who has consistently departed from the accepted code of operating ethics.

12. The ruling of the Executive Council NZART will be final.

13. *Awards:* Separate awards for phone and for CW. *World-wide except VK/ZL* (A) Attractive multi-colour certificates to the top scorers in each country (call areas in "W", "J", "U".) (B) Depending on reasonable degree of activity, separate awards may be made for top scores on different bands. (C) Where many logs are received, consideration will be given to awarding second and third place certificates.

To VK and ZL Stations: Open Section — Certificates — (A) To top three scorers in each call area VK/ZL. (B) To top three scorers on individual bands — (160, 80, 40, 20, 15, 10) in VK and ZL.

**** EXTRA AWARDS will be made depending on activity. The aim is to recognise operating ability*

14. *Entries from VK/ZL Stations* should be posted direct to — NZART Contest Manager ZL2GX, 152 Lytton Road, Gisborne, New Zealand. To arrive before 31 December, 1984.

Entries from Overseas Stations — Posted to the above address to arrive not later than 31 January, 1985.

SWL Section

1. The rules are similar to the transmitting section but it is open to all members of any AR society in the world. No transmitting station is permitted to enter this section.

2. The contest times and logging of stations on each band per weekend are as for the transmitting section except that the same station may be logged twice on any band — ONCE ON PHONE AND ONCE ON CW.

3. To count for points, the station heard must be in QSO exchanging cyphers in the VK/ZL/Oceania DX Contest and the following details noted — date, time in UTC, call of the station heard, call of the station he is working, RS(T) of the station heard, serial number SENT by the station heard, band, points claimed.

4. Scoring is on the same basis as for the transmitting section and a summary sheet should be similarly set out.

5. Overseas stations may log ONLY VK/ZL stations but VK receiving stations may log overseas stations and ZL stations, while ZL receiving stations may log overseas stations and VK stations.

6. Certificates will be awarded as listed in the section under awards

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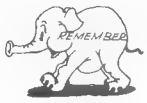

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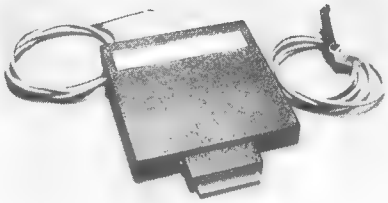

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1983 VK/ZL/O CONTEST RESULTS

Greg Williams VK3BGW
WIA VK/ZL/O CONTEST MANAGER
Box 270 Greensborough, Vic. 3088.

This was my first year as VK/ZL/O Contest Manager and I certainly learnt a lot, next time the results will be released much sooner, my apologies to all who have waited so patiently.

A note of explanation may help to clarify the apparent endless rule changes. This contest is run year about by the WIA and the NZART. The WIA rules allow for VK/VK and ZL/ZL contacts on 80 metres whereas the NZART does not allow for contacts within one country on 80. I would appreciate any constructive comments concerning the rules and just point out to those who did not like the changes I made, that the only change to the 1981 WIA rules that I made was to change the name and address of the contest manager!

There was some confusion concerning Oceania stations and this was noted, next year, these will count the same as a VK or ZL station. Now to the results Les VK2WU showed a clean pair of heels to the rest of the field in the phone section being 1.4 megapoints ahead of second place, well done! There were some excellent scores from several novice operators even in the ALL BAND section where they have only three bands compared with six available for AOCP licencees. The CW section saw a close contest between VK4XA and VK2APK with VK2APK proving victorious.

Band conditions on both weekends were not good but perseverance was rewarded with some reasonable openings — usually short. There were many comments on air about the rules and this reinforces that old saying of "study and double check the current rules" when operating in any contest.

The quality of the logs was quite good this year however you should include any check lists etc, particularly multiplier check sheets. Details of the dupe checking system used would also be of assistance in log checking. For anyone unsure of how duplicate and multiplier checking should be done please send a large SAE to the address shown above and I will send you a VK/ZL/O contesting kit, this includes dupe checking sheets, multiplier check sheets, log sheets and instructions.

Well let's get into the results, my thanks to all who sent check logs, these are all noted at the end of the "world" listing, and don't be fooled if the individual band scores don't add up to the total score, total score is equal to total QSO points multiplied by total multipliers.

COUNTRY — VK/ZL MODE — PHONE CLASS — TRANSMITTING — 24 HOURS

Callsign	Band	160 m	80 m	40 m	20 m	15 m	10 m	Total
VK2WU*	All	80	8400	145000	371124	56882	161820	3.401454
ZL1AAS*	All	1120	21320	30485	81406	132860	133416	2.063115
VK5MS*	All	0	0	122550	320804	180266	2871	2.010744
VK4VU*	All	0	250	2990	49910	141696	76014	964432
ZM2AH*	All	480	360	20650	118544	36064	6384	694668
VK1DH*	All	0	0	125	51997	60952	9000	389364
AX6NCW*	All	0	5160	0	0	76622	47940	338067
VK5NOD	All	0	5590	0	0	45436	38610	253935
VK3CGH*	All	0	9360	0	812	11760	27084	223950
AX3XQ	All	0	9490	0	0	115154	0	214368
VK6KBT	All	0	0	0	0	85360	19656	186948
AX2AHD	All	0	13000	0	3763	5544	0	124950
VK3DAK	All	0	8100	0	13289	2940	0	110050
VK3SM	All	0	0	0	12741	13640	1425	76820
ZK2NU	All	4140	9480	325	378	720	24	67727
VK2PS	All	7000	0	0	780	0	6300	64610
ZM1IM	All	0	1620	125	3618	5040	864	56316
VK3AKK	All	2080	24500	0	0	0	0	41280
VK4AGP	All	0	2160	0	342	128	8979	37544
VK4KHZ	All	0	3190	0	0	7938	663	36719
AX3XB	All	0	4620	180	4200	8	12	35600
VK3DNC	All	0	3850	5	2585	242	0	30240
ZL3TX	All	80	1280	0	4	2820	672	19264
ZL3HT	All	960	4420	320	0	0	0	14580
VK1LF	All	0	1400	20	420	72	27	9576
VK4NAS	All	0	0	0	0	512	147	1219
ZL2GQ	All	0	0	0	99	2	0	130
VK5BW*	80	0	66810	0	0	0	0	66810
VK3FY*	20	0	0	0	465290	0	0	465290
VK3DJE	20	0	0	0	290043	0	0	290043
ZL1AXB	20	0	0	0	287984	0	0	287984
VK2ABC	20	0	0	0	9324	0	0	9324
VK2VPD*	15	0	0	0	0	50718	0	50718
ZL1AGO	15	0	0	0	0	6890	0	6890
ZL2AXV	15	0	0	0	0	578	0	578
VK2KCN*	10	0	0	0	0	0	81096	81096

Best on Band: VK2PS VK5BW VK2WU VK3FY VK5MS VK2WU

COUNTRY — VK/ZL MODE — PHONE CLASS — TRANSMITTING — 8 HOURS

VK5ABW*	All	1680	3520	7955	20384	11640	0	243832
AX3KHI*	All	0	13860	0	0	78370	0	174276
ZM1AKY*	All	0	0	0	42042	714	18810	148482
VK2BQS*	All	0	40	0	0	84102	5880	140256
VK5QX	All	0	1840	180	31152	10920	0	139668
VK2APK	All	2720	6150	80	4482	7900	0	132441
ZL1BXW	All	0	40	0	0	10296	57723	128875
VK3AIE	All	0	0	0	80	84	960	2520
VK3BEE*	160	12880	0	0	0	0	0	12880
ZL1BVK*	80	0	11970	0	0	0	0	11970
VK2XT*	20	0	0	0	0	146176	0	146176
VK3BKU	20	0	0	0	1496	0	0	1496
VK4PJ	20	0	0	0	460	8	0	594
ZL2AQU	20	0	0	0	340	0	0	340
AX3CYL*	15	0	0	0	0	62560	0	62560
ZM1AFU	15	0	0	0	0	27060	0	27060
VK8KGA	15	0	0	0	0	11918	0	11918
VK2VFI*	10	0	0	0	0	0	34821	34821

Best on Band VK3BEE AX3KHI VK5ABW ZM1AKY VK2XT ZL1BXW

COUNTRY — VK/ZL MODE — PHONE CLASS — RECEIVING — 24 HOURS

ZL-287*	All	40	4400	14945	12600	29898	192	277166
L30371*	All	300	7950	210	2805	1728	27	65200
L30037	All	0	11480	0	1554	720	0	62238
SCDX-490	All	20	1140	5	322	1332	63	14319

Best on band L30371 L30037 ZL-287 ZL-287 ZL-287 ZL-287

COUNTRY – VK/ZL MODE – CW CLASS – TRANSMITTING – 24 HOUR

VK2APK*	All	320	8200	105840	36279	32032	28359	10878
VK4XA*	All	300	2200	45360	53742	33066	67266	100926
ZL1AIZ*	All	40	23010	129000	8268	2808	19488	738700
AX3BLN*	All	0	770	51480	54450	34726	17922	726978
ZL2BR*	All	0	0	30940	39431	76270	32706	717408
VK2BQQ	All	0	200	64680	49910	34224	18042	716798
ZL1HV	All	0	0	0	18685	72884	32850	362937
VK3AUQ	All	80	1200	4950	15390	12720	28968	300312
VK2AQF	All	180	1360	12000	10296	14200	13050	280750
VK2WU	All	0	360	0	12963	21280	36450	234950
VK3AEW	All	0	550	18150	10496	12524	3168	206564
VK4ANY	All	0	1040	1980	6200	6240	19947	157009
VK1DH*	All	0	360	1125	21400	19344	1836	156735
AX3XB	All	180	8610	3500	4233	312	672	96642
VK2PS	All	960	2200	0	2772	3696	2940	78080
ZL3AGI*	All	0	90	2400	11890	9010	0	73470
VK4UR	All	0	0	0	8024	12036	0	40894
VK6VZ*	All	0	0	0	6386	6240	315	33060
VK3AMD	All	0	960	0	0	0	8514	16218
VK3DNC	All	0	1120	320	2214	0	0	14224
VK3XQ	All	0	0	45	0	11760	0	13275
VK3RJ	All	0	250	1840	0	928	0	8251
ZL2GQ	All	0	0	0	2280	1664	0	7986
ZM2AGY*	80	0	157700	0	0	0	0	157700
ZL3PJ	80	0	11040	0	0	0	0	11040
VK2CIA*	40	0	0	180120	0	0	0	180120
VK3MR*	20	0	0	0	92444	0	0	92444
VK5AFX*	20	0	0	0	45216	0	0	45216
VK3BKU	20	0	0	0	8094	0	0	8094
AX6RZ	20	0	0	0	7072	0	0	7072
ZL2QW	20	0	0	0	551	0	0	551
ZM1AFU*	15	0	0	0	0	72036	0	72036
VK4SF	15	0	0	0	0	66000	0	66000
VK4XJ*	10	0	0	0	0	0	19116	19116

Best on band VK2PS ZM2AGY VK2CIA VK3MR ZL2BR VK4XA

COUNTRY – VK/ZL MODE – CW CLASS – TRANSMITTING – 8 HOURS

ZL1BHQ*	All	0	0	0	10287	33708	21450	195300
ZM2RY*	All	0	400	37060	9240	2	0	109296
ZL1BXW	All	0	0	150	0	20020	21840	92486
VK2EL*	All	0	0	0	23000	2464	3312	71142
VK5QX*	All	0	0	1800	6300	7950	0	51200
ZL1BUV	All	0	1050	8640	1	0	0	17204
ZL1AIH*	80	0	33120	0	0	0	0	33120
ZL2AQU*	20	0	0	0	720	0	0	720
ZL1BGT*	10	0	0	0	0	0	28944	28944

Best on band ZL1AIH ZM2RY VK2EL ZL1BHQ ZL1BGT

COUNTRY – VK/ZL MODE – CW CLASS – RECEIVING – 24 HOURS

L30042*	All	0	400	180	416	780	168	10340

COUNTRY – EUROPE MODE – PHONE – CLASS – TRANSMITTING

	BAND	TOTAL SCORE
Y57WG	All	7612
Y44XI	All	5764
HA7UG	All	5250
HB9ADD	All	2808
YU2HDE	All	2688
HB9IK	All	2622
OK2QX	All	2158
Y54VA	All	2080
G3TMV	All	1564
Y22JJ	All	1536
OZ8RH	All	1312
Y24RL	All	1104
Y37XJ	All	1014
LA9DI	All	864
G5MY	All	780
SM5IMO	All	744
HB9BPP	All	726
Y23DG	All	704
GW4BLE	All	666
OZ5EV	All	504
DL3RD	All	336
Y22WF	All	126
Y22GG	All	60
Y38VE	All	56
HA6ON	20	3102
I8SAT	20	2288
OK1AD	20	512
OH1ZAA	20	416
HB9DX	20	416
Y24XJ	20	396
TO8WE	20	312
HA6NW	20	308
YO2BEH	20	280
OK3KXR	20	240
HA5OO	20	204
OK2DB	20	132
DJ5GI	20	126
9H4G	20	108
OH4PW	20	96
OK2KOZ	20	84
LZ1KKZ	20	70
Y78XL	20	56
OH1TD	20	48
OK1ONC	20	42
SP6JIR	20	40
OK3YK	20	24
OH7NW	20	24
Y32KE	20	20
YO9BVG	20	18
OK3CFP	20	16
OK1KZ	20	12
Y51TG	20	12
SP6IXO	20	8
SM0KV	15	560
LZ1KWS	15	288
OK2BJR	15	110

COUNTRY — NORTH AMERICA MODE — PHONE CLASS — TRANSMITTING — 24 HOURS

	BAND	TOTAL SCORE
K6SVL	All	27000
W3GM	All	6526
W7PQE	All	2552
K9GTQ	All	540
N4MM	All	306
WA3HUP	20	1800
VE3GCO	20	1320
W2FCR	20	576
VE3FEA	20	224
N1BRT	20	150
KW2J	20	54
K1BV	20	30
W0GOQ	10	1794
AA6EE	10	24

COUNTRY — JAPAN MODE — PHONE CLASS — TRANSMITTING — 24 HOURS

JA6YAI	All	18574
JA5AHH	All	9300
JA6GGD	All	7800
JA0VHI	All	5916
JH1KLN	All	4914
JA7YCQ	All	3952
JA9ZQ	All	2848
JR7OMD	All	2592
JA6EFT	All	2160
JA7TJ	All	2040
JH8JYV	All	1802
JR3WXA	All	1596
JH8GQZ	All	1558
JA1JGP	All	868
JH1XIT	All	792
JA1AAT	All	754
JH4IFF	All	728
JA4ESR	All	528
JR2VLS 1	All	280
JA1OYB	All	204
JA1AAN	All	160
JA3BLN	20	322
JA5CPO	20	4
JA0FMB	15	594
JL1KCO	15	528
JH8NPW	15	308
JR3KAH	15	240
JH2XTV	15	238
JH9GRM	15	210
JA7FAS	15	120
JE7DOT	15	84
JA4AQR	15	70
JP1SRG	15	48
JO1MKS	15	40
JH5OXF	15	30
JG3DOR	15	8
JA3NMV	15	2
JR6GIM	10	1408
JM1TUY	10	968
JE2IEQ	10	336
JA1FO	10	320

COUNTRY — USSR MODE — PHONE CLASS — TRANSMITTING — 24 HOURS

UA0CCW	All	23520
UK4FAV	All	9536
UA0LCZ	All	8700
UK7PAL	All	7280
UW0MF	All	6696
UK2PCR	All	4720
UV9PP	All	4550
UV3CE	All	4360
UA9YCO	All	3872
UK9HAD	All	3652
UA4PWW	All	3400
UA3DRB	All	3240
UK5QBE	All	3230
UW4NH	All	3230
UK3SAB	All	3094
UK7LAA	All	2880
UK0AAB	All	2244
UK4WAB	All	2232
UA3DCG	All	1836
UA9ND	All	1110
UA3QBP	All	576
UR2OI	All	572
UA9QBE	All	506
UK2RDX	All	486
UK0QBE	All	204
UA3QHZ	All	40
UW6FC	40	110
UP2BHC	40	48
UR2FQ	20	832
UA4ACD	20	468
UA0CFX	20	266
UR2RIY	20	180
UO5OHH	20	168
UK3TBF	20	156
UC2ABF	20	156
UF6FFF	20	156
UF6FER	20	120
UW1AE	20	120
UP2PWB	20	32
UR2RL	20	24
UC2WAZ	20	18
UA6ADV	20	12
UP2BAO	20	4

COUNTRY — OTHERS MODE — PHONE CLASS — TRANSMITTING

HL1ABR	All	2880
HK5FCI	20	30

COUNTRY — WORLD MODE — PHONE CLASS — RECEIVING

JA6-9330 JA1	All	11484
UB5-073-3135	All	6594
OK1-22309	All	4212
OH6-401	All	2880
ONL383	All	1476
UB5-077-529	All	1088
NL-8297	All	1056
UL7-023-406	All	980
Y2-8983F44	All	960
Y2-5223 MS1	All	924
BRS-52543	All	900
UP2-038-794	All	812
Y2-EA79002B31	All	270
Y2-4406G51	All	234
SP-1151 PO	All	224
Y2-7215164	All	156
OK3-13095	20	1440
OK1-21672	20	432
OK3-26327	20	336
Y2-18168D46	20	224
OH6-145	20	208
OE1-109976	20	156
Y2-EA11249F49	20	132
UB5-073-1610	20	80

COUNTRY — EUROPE MODE — CW CLASS — TRANSMITTING

HA7UG	All	4600
HB9IK	All	2596
HB9AGA	All	2520
HA5LZ	All	2256
OK1AVD	All	2088
OH3TY	All	1980
YU2HDE	All	1728
OK3ZAM	All	1488
SP7KTE	All	1400
G5MY	All	1320
OH2BAH	All	1248
LZ2KRU	All	1116
Y24EA	All	928
Y37XJ	All	928
HA5KDB	All	918
OK3ZAM	All	868
DL3RD	All	720
Y54AU	All	696
HE9EVI	All	660
HB9DX	All	616
HA8ZC	All	600
Y30BUB	All	520
PA0LVB	All	352
PA0WRS	All	304
OK2BCI	All	270
YU2LM	All	224
OH2EJ	All	220
OK1AWC	All	160
OK1AWF	All	80
OH9TD	All	18
OK1DGN	All	16
OH2BCI	80	32
EA5TX	80	18
F9YZ	40	50
YO3CD	40	24
HA7RB	20	968
OK1AD	20	900
OK2BGR	20	680
OH1ZAA	20	486
G3VDW	20	396
OH6QU	20	288
Y22WF	20	240
OK2PDT	20	208
OK2KOZ	20	160
HB9CSA	20	132
YO2BEH	20	130
OK2BPU	20	126
OK1KZ	20	100
Y83MLW	20	100
Y22DK-A	20	84
OH7NW	20	60
Y38YE	20	48
LZ2SO	20	48
LZ1KWS	20	48
EA7CJM	20	42
OK1AXB	20	24
EA4BV	20	18
OH3FM	15	378
SM0KV/0	15	132
SM6NWL	15	8
EA7ALG	15	4
OH2BHZ	15	2
OH7UM	15	2

COUNTRY — NORTH AMERICA MODE — CW CLASS — TRANSMITTING

KFIZ	All	10406
W3GM	All	8020
W8UVZ	All	5184
K4JRB	All	4648
K4PI	All	2860
K3ND	All	1886
KW2J	All	1792
AJ0N	All	1548
W7PQE	All	1088
K9VKY	All	928
NE8I	All	784
KA7FEF	All	400
VE2AEJ 3	All	306
K3NTD	All	224
AA6EE	All	192
W9YCV	All	50
KA2MXO	10	144

COUNTRY — USSR MODE — CW CLASS — TRANSMITTING

UA0LCZ	All	8892
UA0SAU	All	8352
UA1DZ	All	7776
UA9OCI	All	7128
UK2PCR	All	5580
UP2NK	All	5376
UK2RDX	All	4898
UK0LAD	All	4814
UK4PNZ	All	4266
UW9PT	All	4104
UK5MAF	All	3504
UA0JAD	All	3364
UA3EAL	All	2982
UA3DUF	All	2860
UK0QAH	All	2832
UK0AAB	All	2484
UA9NN	All	2300
UK4WAB	All	2166
UA3DCG	All	2160
UK5QBE	All	1870
UK5XBA	All	1764
UK0LAG	All	1700
UJ8JAS	All	1672
UK2BCR	All	1666
UL7PBY	All	1638
UA4PWW	All	1632
UA3TDK	All	1496
UK9HAD	All	1404
UP2BAO	All	1378
UK8AAI	All	1312
UK3SAB	All	1280
UA3QBP	All	1216
UW3UO	All	1088
UK2BBX	All	840
UK3TCO	All	792
UK2GAB	All	650
UC2WAZ	All	650
UC2AW	All	650
UA9CBM	All	588
UC2ACO	All	456
UA3FT	All	440
UA4HDV	All	400
UK0QBE	All	352
UR2QD	All	340
UK9FEN	All	272
UA0JEH	All	270
UL7PCZ	All	128
UF6FAL	All	70
UR2OI	All	60
UA0CDM	All	48
UA4ACA	40	12
UA9COT	40	2
UQ2GEC	40	2
UR2RMB	20	800
UA6LCN	20	594
UB5CBA	20	560
UA9CGP	20	414
UW1YY	20	210
UR2FU	20	208
UF6FFF	20	144
UK3TBF	20	108
UQ2GHG	20	96
UK6AAJ	20	90
UK9FKM	20	90
UB5QIS	20	56
UB5QDU	20	40
UB5QAP	20	2
UR2RKS	15	308
UA0ZBP	15	280

COUNTRY — JAPAN MODE — CW CLASS — TRANSMITTING

JH4IFF	All	11430
JA6BIF	All	7488
JA6YAI	All	6666
JA9CWJ	All	6272
JA8AQ	All	5704
JH8JYV	All	5696
JA7IC	All	5340
JI3AXU	All	5280
JR3WXA	All	4712
JA6GU	All	4428
JH7WKQ	All	3540
JA8SW	All	3248
JA7DOT	All	3120
JH3KDZ	All	2968
JA0CVC	All	2808
JA0XD	All	2700
JH1KLN	All	2550
JH6HSW	All	2470
JA4ESR	All	1932
JH2HPO	All	1600
JR7BTI	All	1584
JR70MD/2	All	1470
JA2MFF	All	1360
JR8OJZ	All	896
JA7TJ	All	504
JA7FAS	All	330
JA1JGP	All	240
JA1OYB	All	198
JA1AAT	All	182
JM1MTR	All	160
JA7KM	All	154
JR4ISK	All	128
JA1BSU	40	154
JH7HLD	40	108
JA3BCT	40	40
JA1BN	20	770
JA1BNW	20	640
JA3BLN	20	378
JA2DN	20	360
JA4AQR	20	8
JA0TMF	15	744
JE1GBI	15	168
JA2KPV	15	48
JA9RYL	10	64
JA1AAV	10	30
JA9ZDX	10	16

COUNTRY — OTHERS MODE — CW CLASS — TRANSMITTING

TI5BGA	All	5642
HK3NBB	All	1664
ZV2ACZ	20	120
KH6IJ	20	90

COUNTRY — WORLD MODE — CW CLASS — RECEIVING

JA6-9330/1	All	7920
UL7-026-199	All	2520
OK3-26694	All	1152
UP2-038-794	All	1064
OK3-26327	All	576
ONL-383	All	546
Y2-8983-F44	All	408
UB5-077-529	All	352
UQ2-037-239	All	286
UB5-073-3135	40	80
HA8773	20	110
Y2-7002 EA34	20	70

Check logs were received from

AX6FS G6QQ HA4XX HA5FA LA1H OH6GD OK1IAR OK1JDJ OX3ZM PA3BLP PA3CWR SM6AWA SP6AZT UA0CCD UA0SGJ UA1ZDW UA3ESN UA6HYL UA9OO UA9OS UB5SBM UB5SG UB5UDG UB5UKO UK5DAA UK9UMB UQ2PG VK4NUN Y24NG Y24SG Y26JD Y30CCM Y47XN Y47ZG Y55XL Y63ZA YO3QK ZL1BUV ZL2AGS ZL2AYO ZL2QW ZL4QJ ZM2VH

INTRUDER WATCH

Bill Martin, VK2EBM
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW 2077

You may remember my reference in this column last month, to the alleged intruder 'NPG', which was listed as San Francisco Naval Radio, and was heard working various amateurs on 21.001 MHz.

I am pleased to say that I have learned that this station was in fact conducting his QSO's legitimately, but, in my ignorance on this occasion, I assumed him to be an intruder. Many thanks to Robin VK7RH, the VK7 IW Co-ordinator, who, with his usual wealth of information, set me straight on this one. This station, 'NPG', was in fact San Francisco Naval Radio, and was working in accordance with 'US Armed Forces Day Special Defence Department Operations! The operations are usually at band edges, and the stations, such as NPG, WAR, AIR, NPO, NSS, etc, work split frequency with US amateurs. This happens on the third weekend of May each year. So file this one away in your memory banks! More information in 'QST', May, 1984.

Interesting letter received from Gib W7JIE, the IARU Region 2 IW Co-ordinator. Amongst other things, Gib says that the Voice of America has retired an ancient transmitter which has been causing QRM on 15 metres for years, and the prime factor for its replacement was the numerous complaints received via the USA Intruder Watch. Bob Knowles ZL1BAD/ZL6IW, the Region 3 IW Co-ordinator, has again been busy furthering the cause of the IW. Bob enjoys the privilege of having a second callsign (ZL6IW), which empowers him to speak to non-amateur stations, (viz: intruders), and politely ask them to QSY. His efforts have culminated in the removal from the bands of RGH-85, a USSR signal (F1A) on 14.169 MHz, and BOZ, a Chinese RTTY station on 14.145 MHz. Well done, Bob!

W7JIE makes the point in his letter that I have often made myself. If you are working a particular frequency, and an intruder comes up, *DON'T QSY*. This is giving in to the intruder station, and suits him right down to the ground. Stick to your guns, and give him a hard time. Even with your QRP transmission, experience has shown that often this has the effect of QRM'ing the intruder station. Don't show him any sympathy — he shouldn't be there in the first place; assuming, of course, that you have established, *BEYOND A SHADOW OF A DOUBT, THAT HE IS IN FACT A BONA FIDE INTRUDER:* Don't get caught and QRM one of your mates conducting a QSO in an exotic mode to which you are unaccustomed!

Propagation reports at hand at the time of writing (July) show that conditions for DX on HF should be pretty miserable for the next six weeks or so. When this column appears in the September issue of AR, hopefully conditions should have improved. A great pity that improved conditions for amateurs will also favour the intruders. All we can do about this, of course, is to continue to support the Intruder Watch, and hope that the DOC takes some notice of our protestations. See you next month, and good DX.

AR

QSP

SATELLITES FOR EDUCATION

Satellite communication came to the Australian Maritime College on 15th June, 1984. That day School of Engineering staff, Michael Collinson, Geoff Wells, John Nash and the Head of the School, Dr John Cannell, together with representatives from the University of Tasmania, Hobart TAFE and the TCAE conducted a maiden broadcast from the AMC. They used the satellite communication terminal installed in the projection room of the AMC auditorium.

The AMC has now joined in the PEACESAT network comprising a wide range of educational institutions and community organisations plus twelve other stations spread across the Pacific Islands. La Trobe University Melbourne is the co-ordinating station for the Australian members. Launceston is the gateway station for Tasmania.

Satellite communication has many advantages. It's extremely cost effective, any number of stations can participate at one time and it's ideal for distance education. Indeed the West Australian Institute of Technology (WAIT) has been using satellite communications for this purpose regularly this year.

The Satellite being used by PEACESAT is a NASA geostationary one launched in 1966, situated over the west Pacific. When this satellite expires, educational institutions hope to gain access to AUSSAT, an Australian domestic satellite to be launched in 1985.

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Dimensions:	165(H) x 62(W) x 40(D) mm excluding projections 179(H) x 64(W) x 44(D) mm including projections
Weight:	Approx. 500g including batteries and a flexible rubber antenna

TRANSMITTER

RF Power Output:	Hi =	2.5W (at 9V) SSB (PEP), FM 3.5W (at 10.8V) 1.5W (at 7.2V)
	Lo	0.5W (at 9V)
Modulation:	SSB =	Balanced Modulation
	FM =	Reactance Direct Shift
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Carrier Suppression:		Better than 40 dB
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Spurious Response:	Better than 60 dB
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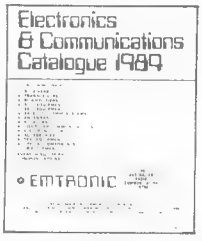

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LISTENING AROUND

Joe Baker, VK2BJX
Box 2121, Mildura, Vic 3500

Ever sat in front of a typewriter, with a blank sheet of paper in it and not knowing what it's going to look like when that first page is full? I think that everyone who has ever dared to express himself in print has had that experience, and I'm no exception. So shall we begin with the weather, which might be a good starting point.

Some of these columns have been written in the intense heat of a Buronga summer when it's not unusual to have 44° Celsius at the end of February. And approximately six months later — the middle of the year as I write this at 3.25 am Friday 22nd June, the temperature on my thermometer in the next room is . . . more than 6° below zero Celsius. The sooner we get over this midwinter bit the better, and come to think of it, we are now at the midwinter solstice.

One of the early signs of the upcoming end of winter that I look forward to is when I hear the football commentators talking about the upcoming "finals", and the end of the footy season which gladdens my heart as well as helping to thaw me out.

I was very pleased to hear, tonight on 80, that Barry, VK3PGD from Wendouree is now very much on the mend following his successful operation a few weeks ago. Prior to this, when Barry used to come on the air in the early morning hours it was by way of therapy to help him pass the time as he sometimes was in considerable pain. Another regular who's now well on the mend is Bart, VK6SE Perth, who also was recently operated on. Still having medical problems, (and for this reason not being heard as we often used to hear him) is Bronte, VK5KV of Klemzig South Australia. Hope you are better by the time you see this Bronte.

One of nature's gentlemen is Mike, VK3KBW of Mildura, just over the river from me. Mike is very interested in tracking the weather satellites and receiving weather pictures from them. This weekend he's building a special aerial so arranged that he can receive the weather pictures no matter where the satellite is.

For some considerable time, I myself have been monitoring the satellite frequency of 145.828 MHz listed in the 83/84 Callbook on page 153 as being the UO9 beacon 1 frequency. Telemetry in short bursts has occasionally been heard, usually around 1315 to 1330 UTC and again anytime between approximately 1700 and 1830 UTC. Occasionally I thought I heard a voice with figures. Later in a BBC programme called "Waveguide" (which replaces the old "World Radio Club) it was stated that UO1 and UO2 are also on this frequency and the fact that attempts were to be made to get UO2 to transmit its data in *synthesised voice*. That, doubtless, is what I have been hearing. The BBC asked those interested in getting more information about these satellites to write to them and all letters would be forwarded to AMSAT UK.

VK3DMZ told me in a QSO on 80 early June that frequencies to be used by the spacelab to be launched in late June — (according to his monitoring of W1AW on CW on 21.080 MHz) are as follows: 3.860, 7.185, 14.295, 21.390 and 28.650 MHz. Thanks to VK3DMZ.

A few nights ago on 80, while Des VK3BSB (Paynesville, Gippsland) was conducting the Cocktail Net, a CW pest sending a series of Vs, and no callsign started to so mess up the net that all decided to shift frequency. The pest followed them, forcing Des and the gang to QSY to 7 MHz. Later, while I was chatting with Alec, VK2KAH of Lightning Ridge, the pest came up on us. We QSY'd but the pest still followed. However when I gave Alec the nudge to try upper sideband, we managed to lose him for a while, and got quite a bit of conversation over before he again eventually found us. Speaking with Mike VK3KBW, Mike said that he thought that the same person may also be responsible for jamming some of the RTTY nets.

What makes idiots like this fellow do what they do? I'm aware that when we, by our chat, acknowledge their presence when they harrass us, we give them exactly the sort of high that their distorted mentality needs, but it's hard to ignore them, and they know that they have a reasonable chance of getting away with it.

But given enough rope they might eventually get themselves caught, for the monitoring stations have big ears and much equipment.

It's 4.05 am here now and the satellite on 145.825 has just burst through twice or three times with its telemetry signal. Unfortunately I have no means of decoding this telemetry. If I can receive this signal on my FT208 with its rubber ducky antenna, it should encourage anyone with much more elaborate equipment to try for it. The BBC said that they also could receive it using a hand held set on the roof of Bush House in London.

I've had a wonderful and most encouraging "on air" response to some of my previous "Listening Arounds" — particularly those in which I wrote about my time on the wartime receiving station run by the Sydney Daily Telegraph and my experiences as a rookie signalman at the Dubbo Army Camp. Those who liked what I wrote may be pleased to note that there's more to come and I will include things that happened to me as a signalman in the Northern Territory, and in the East Indies (Morotai Island). After the end of the war, ex-servicemen were asked to write of their experiences which were to go into a book called "Khaki and Green". My offers to contribute at that time were rejected, so AR will be getting an "exclusive" no doubt.

Within a few days I'll be in Melbourne again, being flown down there for medical examination and I'll have my FT208 with me. From my motel room I will be able to go through the Melbourne repeaters, and probably some stories will come out of that visit providing something to write about in future columns.

Attention you computer freaks. Be it known that from henceforth I am trying to cotton on to all the computer jargon that I hear on air these days and have decided that before some kindergarten schoolkid buttonholes me on my non-existent knowledge of his latest toy, it's high time I got myself one. I'm starting off on the bottom rung — with a pocket calculator but I'll get there no doubt.

73 for now from Joe VK2BJX

AR

From Joe's Photo Album

Bill VK3PWR met Joe at Spencer Street Railway Station.

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Photographs by Digger Smith VK3BFF

WARRNAMBOOL ARC

The Warrnambool Amateur Radio Club recently called a meeting for all interested amateurs to discuss means of funding the Warrnambool two metre repeater (shown in the foreground of the group photo). Twenty-five amateurs attended this meeting.

It was decided at this meeting to run another test from the summit of Mt. Warrnambool, which was carried out the next weekend using the same power and antenna as will be used in the final installation. Digger VK3BFF, and Mark VK3OX carried out this test. (Picture shows Mark VK3OX using the transmitter.) All told, thirty stations all over the Western Zone called in with reports. This site will cover most southern areas not serviced by Channel 7, Mount William.

The frequency has been allocated for the Warrnambool Repeater.
Output 147.050 MHz
Input 147.650 MHz

AR

SUNSHINE COAST ARC

The Sunshine Coast Amateur Radio Club meets on the first Tuesday of each month at the Bli Bli Public Hall. The Club Net operates each Thursday evening at 0930 UTC on 3.595 MHz, changing at 1000 UTC to 28.400 MHz.

Club Award is "Pelican Award".

AR

SOUTH WEST AMATEUR RADIO SOCIETY

The Annual Convention of the South West Amateur Radio Society for 1984 will be held at Young, New South Wales on 29th and 30th September. The Convention site is the Young Showground. The programme includes Trade Displays, Foxhunts, various other events, displays and competitions.

Further details of the programme will be announced on Divisional Broadcasts. Accommodation requirements for Hotel, Motel and Caravan Park should be forwarded as soon as possible to Peter Page VK2APP, Stoneridge, Monteagle NSW 2594. Phone (063) 83 6206.

AR

POWER LINE INTERFERENCE SURVEY

The National EMC Advisory Service would like to hear from any Amateur Radio Operator, Short Wave Listener or other interested person who is suffering excessively high "power line" noise (PLI) to reception and has been unsuccessful in obtaining remedial action from the authorities.

We require as much information as possible; for example, Does it affect your TV? Frequencies affected, Level of noise ('S' meter reading if possible), Distance of antenna system from nearest HV (11000-66000V) power line or equipment.

Please direct your report to:- *PLI Survey, P.O. Box 300, Caulfield South, 3162.*

AR

FORWARD BIAS

VK1 DIVISION

John MacPhee
FORWARD BIAS EDITOR
36 Kavel Street, Torrens, ACT 2607

By now, students that sat for the August exams, should have received their results. To those that passed, my congratulations, to the others, don't feel bad, just try again next time. If any student has any comments about the lectures held in VK1 or what they would like added to the existing programme, please don't hesitate to write to me at my QTHR.

As the AOCP lectures have concluded for 1984, I wish to thank, on behalf of the Committee, Glen Torr for his very successful lectures and untiring efforts in his role. Thanks again Glen.

The NAOCP lectures are very well attended and we have already had very good results in the previous exams this year. The lectures will conclude in November for 1984 and we want to thank Ted Radcliffe VK1TR for his excellent efforts also. Thanks Ted.

"VK1 INTRUDER WATCH SERVICE"

A request has come from our Intruder Watch committee man, Grahame VK1GP, concerning Moscow Naval Radio — Callsign "UMS". Grahame reports the following ' *"UMS" has long been an intruder into the amateur bands. In summer, he uses 14.141 MHz and winter switches to 21.032 MHz. "UMS" is listed as Moscow Naval Radio for frequencies 11.132 and 11.140 MHz in the confidential frequency list published by Gilfer Associates Incorporated. "UMS" has been listed as the user of 21.032 MHz in the latest confidential frequency list and Moscow is apparently trying to establish a legitimate claim to the frequency. Bill VK2EBM, the Federal ISW Co-ordinator, requests a concerted effort be made to remove the nuisance from the bands. "UMS" transmits RTTY at various speeds and shifts, frequency shift keyed Morse and CW.'*

VK1 reports may be forwarded to Grahame, VK1GP, at the monthly meeting or by post QTHR.

Thanks Grahame for your information and hopefully the efforts of all VK1s will help remove "UMS" from the bands.

The following item was written by John McKendrick VK1WK.

'As a regular on 20 metre SSB and CW oft the question is asked, "Where are the rest of the VK1 gang . . ." — "Haven't worked a VK1 for three years". Openings for VK1 are fairly predictable this time of year; 2100 UTC short path Europe and UK long path South America; 0700 UTC Long path UK and Europe 1100 UTC short path US (East Coast) and Canada, USA (West Coast) 21 MHz 0130–0230 UTC good openings.

40 metres around 7.180–7.190 the US is easily worked on a wire at 1100 UTC. 80 metres has proved noisy but interesting during the period 1100–1300 UTC.

So how about a few more VK1's taking up space on our part of the spectrum!!

A few lines on what to see when visiting VK1 — besides the colourful locals!! The Telecom Tower, Black Mountain, the Australian War Memorial; New and Old Parliament Houses; Lake Burley Griffen, the National Library, the High Court and Lanyon Homestead to name a few. It is always a good idea to book ahead for accommodation in Canberra — there are many good motels, hotels and caravan parks but the ACT is popular — particularly in the school holidays.

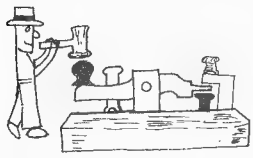
Bring, or buy, a good map — navigation can be a problem or give a call on 2 metres 146.950.'

Thanks John for that report.

If you have anything to put into your column, please send it to me QTHR.

Until next time. Good Health and Good Dx.

73
John
AR



POUNDING BRASS

Marshall Emm, VK5FN
GPO Box 389, Adelaide, SA 5001

As I indicated last month, a lot of time has passed since this column began, and I have started receiving enquiries from new novices and potential Brass Pounders, on subjects which were covered some time ago. So we'll go right back to basics this month, and talk about establishing a CW contact.

Establishing a contact on CW is basically no different from phone operation. There are only limited ways to do it — one can call "on sked"; one can make or answer a CQ call; one can tail-end a QSO in progress. The first option is mentioned just for the record, but as on phone, there is an art to making or answering CQ calls on CW.

If you are calling CQ, the traditional three by three call is your basic tool. *CQ CQ CQ DE VK5FN VK5FN VK5FN AR K.*

It's called a 3 x 3 becaue, as you can see, the CQ is sent three times, followed by DE and the sending station's call sign sent three times. Don't worry about the "AR K" for now, we'll cover that later.

Calls can be longer or shorter depending on band conditions and your expectations of getting an answer. For example, if the band is empty, extending your call increases the odds of someone hearing you. On the other hand, if you have heard someone tuning up or the frequency has just become vacant, a one by one call may be adequate. If you are using a suffix, such as "/QRP", it severely lengthens the identification portion of the call and it doesn't hurt to stick one more CQ in before AR, eg, "CQ CQ CQ DE VK5FN/QRP (three times) CQ AR." This is done so that a station picking you up during your identification doesn't have to wait for your next call to know that you are in fact calling CQ.

If you are answering a CQ, you need only send the other station's call once, because the odds are he knows it fairly well and just needs a moment or two to change over and fine-tune your signal. Send your own call at least twice (depending on conditions) and conclude with KN (more about procedural symbols, or prosigns, later): *VK5FN DE VK9XYZ VK9XYZ KN.*

Keep in mind that you don't even know if he can copy you at all yet — you may be S2 to him even though he's just blow your front-end!

In tail-ending it is important to observe the same rules as on phone — be sure the channel is clear (in other words the stations must be finished, not finishing), and try to determine whose frequency it is. The trick is to be sure to wait long enough not to interfere, but to get in before the other guy changes frequency or shuts down.

And now for a word about procedural symbols, or prosigns, (such as AR and KN as used above). Procedural symbols are letters or special symbols which are used with special meanings in CW working. K, for example, means "over to you", or just "over". Some prosigns are not letters at all, but sound like two or more letters run together. Hence the line on top of them (overlining).

AR, for example, is how we write the symbol which is sent as ·—·—· (di-dah-di-dah-dit), or the letters A and R without a space between them.

Probably the least understood of all procedural symbols are CT and AR. On balance CT is probably overused and AR misused. CT is generally understood to be "the commencing signal", but there are only two places it really needs to be used — in the DOC Morse Code examinations, and in formal message traffic. It really has no place in the ordinary QSO, and its use before a CQ call is superfluous. It means one is about to send some sort of information, but if a receiving station has copied the CT he has already begun to copy information. So why use it at all in a QSO?

AR is generally understood to mean "finishing signal", but it has a more strictly defined meaning as "End of Message". There is no consistent pattern in its usage It can be used after a CQ call as an invitation to any other station to transmit, and in that case does not need to be followed by K. Of course it goes without saying that CQs are very often followed by AR K. AR does not have to be used at the end of each over. Some ops put it before the call signs, some after. But if it is used after the call signs it is again a non-specific invitation to transmit, and if it is followed by KN (named station only to transmit) then you have a contradiction. I generally follow the Japanese style and put AR before the call signs to indicate the end of the actual message as opposed to station identification.

And now for a word about speed. The Golden Rule is: *Call at the speed you want to work; Answer at the speed of the other station or at your own speed if he is faster.* If everybody does this, you will never ask or be asked QRS (that's the theory!).

If you have absorbed the above, you should have no trouble establishing contact. Think it over, and if the above procedures make sense to you, use them and don't worry about the other guy's sloppy procedure.

AR

QSP

GOOD VIBRATIONS

Question: What does a personal computer, a shoe and Morse code have in common?

Answer: Combined, they have opened a new world for Raymond WA2GXI, and allowed him to live a fuller life. Ray lost his sight and hearing at a very early age and relies on a home computer to keep personal files. To use his computer, Raymond activates a device inside his shoe that was developed by an electronics engineer and student. This device transforms the alphanumeric information that appears on the VDU into Morse code impulses that Raymond can read with his "foot".

Adapted from QST May 1984. AR

VK2 MINI BULLETIN

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
PO Box 1066, Parramatta, NSW 2150

TO BE DONE

1984 is fast disappearing and with spring starting it is time to undertake all those projects shelved during winter. There are however two important things for you to do — the first is to post off your RD log if it is still in the shack and the other is to attend the Seminar at Amateur Radio House on Saturday the 22nd September. It is planned to have four speakers. The programme will start at 10.30 am, with a break for lunch and a mid afternoon finish. The final programme was still being formulated as these notes were being compiled. The broadcasts will advise and remind you nearer the date.

BROADCASTS

Besides the Divisional voice broadcast the ANARTS group conduct two transmissions each Sunday in the RTTY format on HF with relays as well as via VK2RTY 6675 in Sydney. The respective news compilers from both programmes exchange information on a weekly basis and include items, where practical, in both bulletins. It still helps if you want your club or group item in both programmes to send a copy to each news address viz:—

ANARTS, PO Box 860, Crows Nest, NSW, 2065.
VK2WI, PO Box 1066, Parramatta, NSW, 2150.

WICEN

Coming exercises include cycle race on Saturday 8th; Sydney Marathon Sunday 9th and the Simulated Emergency Test over the weekend 15/16th September. Outward Bound Canoe Classic on the Hawkesbury 13/14 October. The July Batemans Bay car rally was cancelled at the last minute due to continued rain over the course and is being rescheduled to a date later this year. Enquiries to WICEN may be sent via the Divisional address or to State WICEN Committee, c/- PO Box 154, Roseville, NSW 2069.

ABUSED REPEATER

The majority of amateurs are aware of the continued abuse on the air and in particular towards the 7000 Dural repeater. The subject was an agenda item at the last AGM. Earlier this year the Minister for Communications, in a letter of reply to several amateurs who had lodged complaints, indicated that the problem has been resolved. Unfortunately, the problem had not been eliminated and despite constant reports to the Department no apparent successful action appears to have occurred. Divisional Council has again brought the problem to the notice of the Minister and urges all amateurs to do likewise. Only the weight of numbers will have the lasting desired effect. Please include a copy of your letter to the Divisional office for information. Much of the abuse is directed at the Institute.

QSL CARDS

The disposal of cards held for longer than two years has been continuing from the VK2 Bureau. Continuous reports have been included in the broadcasts and has resulted in many enquiries as to cards held. Even with the response there are still over a ¼ million unclaimed cards for over the two year period. There are also many for less than the two year period which are also unclaimed. If you have not recently advised the Bureau of your card handling requirements — even if you do not collect — then please send off a SAE today to enquire or advise. *Have you had a callsign change?* Then advise the date of change. Write now to VK 2QSL Bureau, PO Box 73, Terabla, NSW, 2287. Another request re cards. If you have made arrangements for them to be sent via Parramatta it was on understanding that you would be able to call in and collect. The Administration Secretary is not in a position to go and check the drawers to see if any cards have arrived for you. If you cannot call in then it is better to make arrangements for the Bureau to post them to you.

If you do not have any printed QSL cards and you need a few to send out replies then enquire from the office about the preprinted ones available for purchase. All you need to do is overprint your personal details.

Best dxing until next month.

AR

VK3 WIA NOTES

Jim Linton, VK3PC
DIVISIONAL PRESIDENT
VK3 DIVISION

ROTARY HEARS ABOUT AMATEUR RADIO

About 25 members of Rotary International listened intently to what the WIA Public Relations Officer had to say. He was guest speaker recently at a luncheon meeting of Rotary's Thomastown branch.

They heard about the history of our hobby, its role during natural disasters, the community benefits, and how anyone from the age of around nine years to 99 years can be involved.

Apart from helping public awareness of amateur radio — the speech is likely to see future radio amateurs among Thomastown Rotarians and their families.

A reporter from a local newspaper attended and wrote a story for the Rotary publication "Rotary Downunder". A report and follow-up story has been submitted to publicise the hobby further.

RSL

As part of the on-going public relations campaign by the WIA in Victoria a list of Returned Services League members is being compiled.

The idea is to publicise the hobby of amateur radio as a leisure-time activity to returned service men and women — many who are now retired or will be retiring within a few years.

If you're an RSL member in Victoria and would like to assist the WIA with this project, get yourself on the RSL/WIA list.

Contact the Institute's public relations officer via the WIA Divisional Headquarters.

OUR HOBBY IN VICTORIA-150

The WIA through its zones and member clubs is participating in Victoria's 150 anniversary celebrations.

A special callsign VI3WI has been reserved for use by the WIA from November.

It's hoped zones and clubs will activate the callsign to spread our hobby's involvement in official celebrations throughout the state.

VICTORIA 150
GROWING TOGETHER 1984 5

Logkeeping and QSL card writing would be done by those using the callsign on a rostered basis, with duplicate logs and completed cards being sent to the Victoria 150 Award Manager.

The callsign will be sought after on DX bands, and the aim is to have it on air for six months from November.

VTAC ELECTIONS

The following were elected to the Victorian Technical Advisory Committee at the VTAC annual general meeting.

Co-ordinator Peter Mill VK3ZPP, Col Pomroy VK3BLE (WICEN), Steve Harrington VK3BYI (Working Bees), Ken Palliser VK3GJ (Programmer), and David Furst VK3YDF (Packet).

Peter VK3ZPP will also handle the portfolio of Broadcast.

The VTAC and its ex-officio members — the repeater committees throughout the Division — have been extremely busy during the past year.

Three new repeaters have been licensed and substantial upgrading work is continuing.

VTAC has also been assisting the Vic Div Council, the Broadcast Committee, and WICEN on technical matters.

AR

QSP

CORDLESS TELEPHONE BAN

The Federal Government has banned the import of cordless telephones not approved for use in Australia.

Industry and Commerce Minister Senator John Button has changed customs regulations due to the import of a large number of cordless telephones which did not comply with DOC standards.

He said the telephones interfered with television reception and those using high power could also cause interference to aviation communications

AR

VK4 WIA NOTES

Bud Pounsett, VK4QY
Box 638, GPO, Brisbane, Qld 4001

Brisbane Amateur Radio Club members George Nelson VK4WZ (left) and Cec Ryan VK4ZIE chatting with VK4WIA News Reader Bonnie.

To guide people to the Barcfest Venue, the Indooroopilly High School Club members, Don VK4BDR, Col VK4AIS and Terry VK4ATH talked them in on 2 metres and HF. Some interstate amateurs could not even pronounce "Indooroopilly", let alone find it!

Far Left

The man behind Barcfest 84, Dave Prince VK4KDP caught at the Barcfest keeping an eye on things.

Left

Federal Secretary, Reg Macey, signs the visitors/attendance book at the May meeting of the Queensland Division. Reg was in Brisbane as guest of the division to attend the 1984 Radio Club Conference.

FIVE-EIGHTH WAVE

Jennifer Warrington, VK5ANW
59 Albert Street, Clarence Gardens, SA 5039

At the Clubs' Convention in April I asked for some input for this column from the Clubs and I am pleased to say that this month I have received some. Henry VK8HA sent down a copy of "Ground Wave" the Darwin ARC magazine. The Editor, Phil VK8KJJ had me 'chuckling' over several of his humorous lines, perhaps he should take over this column? On the serious side, the Club is now "firmly entrenched" in an area within the Sports House complex at Fannie Bay and on his return from VKs 5 and 3, Henry was happy to discover that an Antenna Farm had "appeared" at the complex in his absence. Their Novice Course, which started on 10 May, has seventeen students and almost 50 percent are ladies! So we shall look forward to having a lot more VK8 YLs in the near future.

Also running a Novice Course at the present time is Naracoorte ARC. Information from Ray VK5AVR, the outgoing Secretary, is that their new President is George VK3ALS and Secretary Rob VK5ET. The club is going well at present and their best kept secret is out of the bag — like Darwin — a new repeater is imminent!

The South East Radio Group (better known as SERG) are still recovering, and patting themselves on the back from what was, by all accounts, a most successful Convention at Mt Gambier on the June long weekend. Even the weather was made to order! The aggregate winner of the events was Colin VK5ACE and the winner of the Club Trophy was the North East Radio Group of Victoria. Congratulations to all concerned especially the organisers.

I recently taped a phone interview with Robyn Brown of 5SE a commercial radio station in Mt Gambier, on the subject of ALARA and amateur radio in general, so I hope that it will have generated some interest in the South East.

David VK5AMK advises that the ESC Committee now has kits of the "Wireless World UOSAT Telemetry Decoder for $40 (plus postage if outside SA) — also, he should by now have the 2m Mast Head Pre-amp Kit using BF981s. All enquiries via GPO Box 1234, Adelaide, please.

We have again been invited to participate in the Electronics Expo at Morphettville racecourse from 2nd-4th November and will be looking for volunteers nearer the time.

DIARY DATES

25th Sept — Display of members equipment.
23rd Oct — Des Clift VK5ZO, will speak on 'Microwave Developments'
30th Oct — Buy and Sell.

CROSS NEEDLE METER
DAIWA

QUALITY PRODUCTS FROM . . .

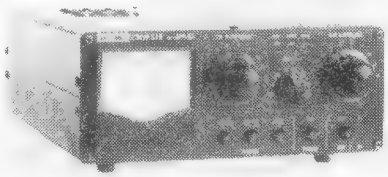
VICOM

VIC Vicom International Pty Ltd
P O Box 366, South Melbourne, 3205
Telephone. 62 6931 Telex AA36935

NSW. Vicom International Pty. Ltd.
118 Alfred Street, Milsons Point, 2061
Telephone: 436 2766 Telex AA70619

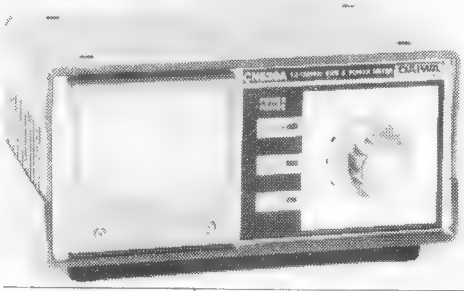
NZ Ma v com Internationa Ltd
P O Box 31-009, Lower Hutt,
New Zealand
Telephone 69 7625 Telex: (74)3334

ANTENNA TUNERS



	CNW-219	CNW-419	CNW-518	CL-680
FREQUENCY	3 5-30MHz (8 bands)	1 8-30MHz (Continuous coverage 17 bands)	3 5 30MHz (8 bands)	1.8-30 Mhz (Continuous coverage 17 bands)
POWER RATING	100W CW	200W CW (3 5 30MHz 100W CW (1 8 3 4MHz	1kW CW (50% duty)	200W CW (3.5-28 MHZ) 100W CW (1.8-3.4 MHZ)
INPUT IMPEDANCE				
OUTPUT IMPEDANCE	10-250 ohm		10-250 25-100 ohm (on 3 5MHz)	10-250 OHM
SWR				
METERING RANGE	20 100W	20 200W	20/200 1kW	No Meter
DIMENSIONS (W × H × D mm)	225 × 90 × 245		225 × 90 × 275	165x75x95

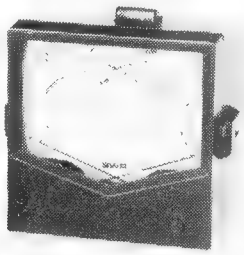
SWR AND POWER METERS

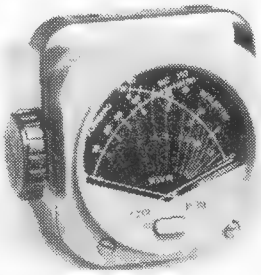


	CN-620A (B)	CN-650
FREQUENCY	50MHz	1 2-2 5GHz
INPUT/OUTPUT IMPEDANCE		
POWER FWD	[illegible] 1kW (2kW)	2 20W
POWER REF	[illegible] 00W (400W)	0 4 4W
SWR DETECTION SENSITIVITY	4W min	0 4W min
TOLERANCE (full scale)	± 10%	± 15%
CONNECTORS	-239	N type
DIMENSIONS (W × H × D mm)		

Compact Size Cross Needle Meters

	CN-520	CN-540	CN-550
FREQUENCY	1 8 60MHz	50 150MHz	144 250MHz
POWER RANGE	200/2kW	20 200W	
IMPEDANCE			
METER ACCURANCY			
CONNECTORS			
DIMENSIONS (W × H × D mm)			

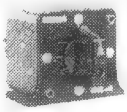




NEW MOBILE METERS

	CN 410M	CN 460M
Frequency	[illegible]	140 450MHz
Input output impedance	50 OHM	
Ratio of Forward vs Reflected power	3 1	
Power range Forward Reflected	15W 150W 5W [illegible]	15W 150W 5W [illegible]
Tolerance	[illegible] 15% AT FULL SCALE	
SWR measurement	1 1 1 0	
SWR detection sensitivity		
Input output connectors	SO-239(type M)	SO 239(type M)
Dimensions	71W x 78H x 100D	

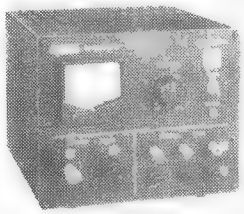
Coaxial Switches

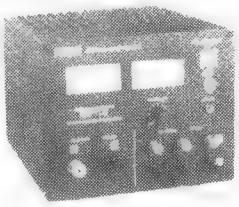


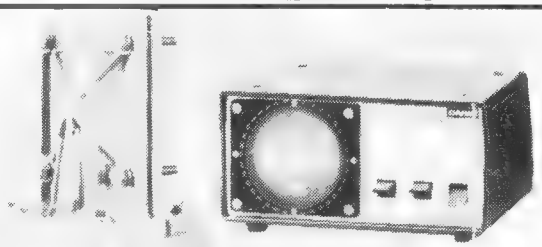
	CS-201/CS-201N	CS-401	CS-4
FREQUENCY	600MHz	800MHz	1500MHz
VSWR	[illegible]		
POWER RATING	[illegible]		[illegible] 250W CW
IMPEDANCE	[illegible]		
INSERTION LOSS	[illegible] dB		
ISOLATION	[illegible]		better than 60dB
CONNECTORS	SO 239 (N type)	SO 239	BNC
OUTPUT PORT	[illegible]	4	4

Unused terminals grounded

POWER SUPPLIES



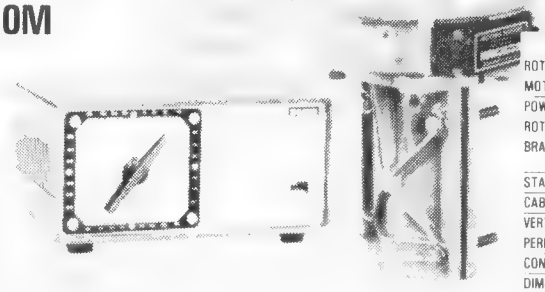




. . . PLUS THE NEW PS-80M ANTENNA ROTATORS

GOING OUT AT SPECIAL PRICES.

PLEASE RING FOR PRICES BETWEEN 9 AM AND 5 PM MONDAY TO FRIDAY.

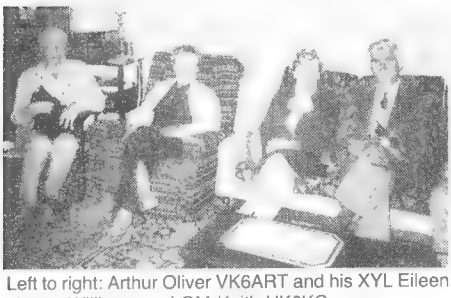


	DR-7500R/X	DR-7600R/X
ROTATION TORQUE	[illegible]	600kg cm
MOTOR	24V AC	
POWER SOURCE	230V AC	
ROTATION TIME (50/60Hz)	60 50 sec	[illegible]
BRAKE	Mechanical	[illegible]
STATIONARY BRAKING TORQUE	2000kg cm	4000kg cm
CABLE TO BE USED	[illegible]	
VERTICAL LOAD	[illegible]	
PERMISSIBLE MAST SIZE	[illegible]	
CONTROLLER		
DIMENSIONS (W × H × D mm)	[illegible]	

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

MEET THE TRAVELLERS NET



Left to right: Arthur Oliver VK6ART and his XYL Eileen, Norma Williams and OM Keith VK6KC.

This photo should interest the large number of amateur operators everywhere, who have used the 20 metre Travellers Net on at 0300 UTC every day since about 1968.

VK6KC of course started it all — hence the name "6 Kilo Charlie Travellers Net."

Arthur with his favorable location near Perth and beam antenna, usually conducts the net in a very polished and efficient manner. Keith is most always standing by to assist, offer advice and steer operators to QSY for person to person contacts. There are many other helpers in other States — VK3YK probably the best known.

73

Keith Scott VK3SS,
34 Henry Street, Maffra,
Vic. 3860.

HISTORICAL MATTERS

"With Horse and Morse" Keast Burke.

I would appreciate any reader who has access to the above book to please contact me QTHR.

This book deals with the activities of a group of Australian signalmen who provided communication by radio, "Wireless", in the Middle East during the latter part of World War I. I believe that three horses carried all the radio equipment of the self-contained unit and that David Garland of Brisbane was a member.

A copy once held in the Brisbane library services has been lost. I would appreciate readers checking their local libraries. Thanks in anticipation.

Peter H Brown. VK4PJ.
VK4 Divisional Historian.

ALAS AND ALACK — NO GO!!

During 1983 I decided to update my radio equipment. After all it was World Communications Year, and any excuse is better than none, XYL's being what they are. I chose *Brand A* HF SSB transceiver only recently arrived in this country, and reviewed in glowing terms in one of our National magazines.

I drove down to Brisbane and presented myself to the salesperson cheque book in hand. I will have one of those I said grandly but first of all please connect it to the 240 volts and let us see if this baby works good. I'm sorry Sir but this store does not have facilities for demonstrations he said. I did not insist which was wrong move number one, but you know well what state your mind is in when you are buying a new rig, you really are going through a dizzy spell, and should be locked up for your own safety. So I parted with my money and returned to QTHR.

With trembling fingers I attach the coax from my TH6DXX, earth wire, 240 VAC, external speaker system. Control yourself: read the instruction book first which I do, and at some length. Comes the moment, lights, camera, action. Oh my God, nothing but muffled audio, the S meter does not move, in the transmit mode no drive. You have bought a lemon.

How many of my fellow amateurs have had this experience and the resulting bitter disappointment. And then the first of many STD phone calls to the sales person who is sympathetic, but whose tone is "what's new pussy-cat". Equipment malfunction has reached epidemic proportions in this area. Three instances this month: Brand A Flagship of the line HF transceiver inoperative on USB. Brand B Duo-Band VHF/UHF transceiver, voice synthesizer no-go. Brand C Flagship of the line HF transceiver power supply fault.

Conclusions: *That Murphy's Law is operating strongly in JA-land and that standards of quality control and final factory inspection have slipped. These sentiments have been expressed in writing to those concerned.*

Yours sincerely,

Joe Ellis VK4AGL
Burnside Road,
Nambour, Qld 4560

CONTEST ERRATA — 18MHz

Last year my contest calendar was marked 15-16th October for the VK/ZL CW Contest as given in the August and September AR "Contest Calendar". So I planned to drive on the long weekend of 8, 9, 10 October to Mt Gambier and SW Victoria.

Reading my October AR in Mt Gambier, I saw the "Contest Calendar" date had been changed to 8-9th October, and it was nearly over.

I enter most CW contests, allowing a few days preparation to read the rules and get organised. After arriving home I found the rules and confirmed the contest was that holiday weekend.

This contest is important in VK/ZL, as the rest of the world work us and we may pick up some new DXCC countries.

The contest manager has just made another mistake. In June 1984 AR the "Contest Calandar" shows the All Asian CW Contest with the + sign to signify it is unconfirmed for the 18-19th August 1984, yet on the next page, the 25th All Asian DX CW Contest rules are published, the dates being 25-26th August 1984.

On the 16th June I received my WW WPX CW 1983 certificate for the first VK5. On 18th June my 10-11th March 1984 BERU CW logsheets were returned to me even though posted to G6LX in Croydon, as per the rules on page 46 of February 1984 AR, also in ARA and CQ magazines. The envelope was stamped "undelivered for reason stated" "return to sender". Surely even death or a change of QTH ought not stop a very popular contest. Losing two contests in about six months is beyond a joke.

On page 8 of April AR, I read with pleasure, that the WIA is suggesting activity days/periods for the WARC bands, and also to introduce an award certificate for WARC band operation. I am pleased to see the update of the countries allocated to these bands on page 17 of June AR. There are a few more DXCC countries active on 18MHz.

Here are some from over 120 stations I have worked: C21, DJ etc, DL/YV5, F, FO8, FR7, G, GM, GW, HB, I, LA, OE, OZ, T30, VK, VK9 Cocos Keeling, VU2, VP9, YU and ZS.

73,
Lindsay Collins VK5GZ,
12 Park Avenue,
Rosslyn Park, SA. 5072.

We now have a new contest manager. Editor.

COUNTER VIEW

I write to counter the view of Sam Voron (letters June, AR) that the possibility of increased EMC problems is no argument against our seeking 1.5 kW PEP output privileges for full call amateurs.

In the fourth paragraph Sam writes *"Interference? It does not matter if 1 or 1000 watts causes the interference, the actions to be taken are in our Regulations Book".*

The inference here is that if it is not the amateur's fault then he should not worry about it. Bad thinking, surely!!

Whenever an amateur is accused, rightly or wrongly, of causing interference it is definitely a matter for concern, affecting not only those directly involved, but also the image of our hobby as a whole.

A good public image is of benefit to us all. Anything which degrades that image is to be avoided unless there are powerful arguments for it.

I suggest that 6dB increase in power is not a powerful argument, even for the emergency preparedness aspect Sam mentions. Such occurences are rare and few demand the extra 6dB, but the disadvantages — more EMC problems — are permanent.

Some think that the increase is only minor so the disadvantages must also be minor. No so. Surely I am not the only one to hear such comments as *"I cannot run the linear as the XYL is watching tele' so am only using 100 watts". OR "I've had a few TVI problems since I obtained my full call".* In short, EMC problems seem to increase more than proportionately to the increase in power. That is only my opinion based on comments on air. Qualified opinion on this point should be sought.

The new legislation may improve the immunity of entertainment equipment, but by how much, and when? In the meantime (and after?) we must live with the problems of a crowded RF environment.

I am not advocating a *"meek and mild"* attitude. I wish only to inject a little caution against the view that being in the right is all that matters.

Yours sincerely,
David Bell VK2BBT,
7 Rugby Close,
Wyoming,
Gosford, NSW 2250.

VHF IN EMERGENCY

I wish to pay tribute to the excellent coverage of the 2m repeaters in Victoria and to the wonderful help that always seems to be available from the amateur ranks when disaster strikes.

During a planned six day four wheel drive trip through some of the less inhabitable areas of the Howitt mountain country, my son Brian, a friend Ken De Vos and myself, had the misfortune to break an axle which left us unable to move our vehicle. A new axle was required, all other parts being re-usable.

The location was about 15 km north of Wonnangatta Station on the Wonnangatta River with high mountains on all sides — not a good location for the only radio equipment we had — 2m. Having farming relatives in the Bairnsdale area and being about their lunch time, it seemed that this would be our best chance of getting help.

On checking a number of 2m repeater frequencies, the only response was the Wodonga repeater, VK3RNE. I called for a phone message to be passed, with an immediate response from Stan VK3BSR. After explanation, Stan phoned Ken Treasure at Lindenow and over the next hour relayed a number of messages.

It became clear that the only axles available were in Melbourne and would require days to deliver, so we decided to walk the 15 km to the Wonnangatta Station hut, taking the 2m gear with sealed battery and portable beam.

The next morning VK3RNE could not be accessed

from the hut so we climbed the adjacent mountain and eventually made contact almost at the top. Stan VK3BSR informed us the axle could arrive in Bairnsdale later in the day with a further six to eight hours to bring it in. We made a sked for next morning, left the radio gear at the top of the mountain and went off to fill in the day.

Next morning, another hike to the 600m level and Stan told us a party had left the night before with the axle and could be expected about 10am. Inaccurate position data lost us and it was two hours before we met the rescue vehicle. Within half an hour of getting back, our stranded vehicle was again mobile and we headed towards Dargo at about 3 pm, some fifty two hours after breaking down. During that time no-one else had passed along the track and walking out would have taken ten to twelve hours.

We were lucky this time. On other trips we had had no radio equipment. When we moved the vehicle a few feet after repairs, VK3RNE could not be accessed! Such are the peculiarities of VHF in those locations.

It took us six and a half hours to reach Lindenow — feeling very grateful for the use of VK3RNE and, in particular, Stan VK3BSR, who made many phone calls and relayed many messages over the three days.

I am also grateful for the use of VK3RLV and especially Bob VK3GQ, who relayed messages to those at home.

Several other amateurs were helpful in passing messages when conditions were difficult. Special thanks to Ken Treasure of Lindenow who organised the axle and the transport, and Neil Hand whose vehicle and local knowledge led us out in the dark.

ANOTHER CASE OF COMMUNITY SERVICE BY AMATEUR RADIO!!!

73,
Bob Neal VK3ZAN,
11 Xavier Street,
Oakpark, Vic. 3046.

This account has been edited. I can tell a similar grateful story about 40m and a boat trailer axle near Lake Eyre!

Editor

7th AUSTRALIAN VENTURE

An invitation is extended to all amateurs to contact VK6SAA at the 7th Australian Venture in Perth between 28th December 1984 and 6th January 1985.

Perth hosted the first ever National Scout Venture in 1965-66 and it was an outstanding success. In the normal rotation of states it is VK6 turn again during the summer vacation at the end of this year. Although much larger than in 1965 it will be much smaller than our Jamboree in 1979 as it is for older members of the movement — the Venturers from 15 to 18 years old. There are fewer of them and a significant number support themselves at work. We expect to maintain the excellent standard set in VK6 at previous National Scout functions.

In keeping with the VK6 habit of innovation, this year the Venture will be split into two parts — for the first three days the Venturers will attend one of eight Country Ventures around WA. These will be at Kalgoorlie/Kambalda, Esperance, Albany/Stirlings, Augusta/Cape Leeuwin, Bunbury/Leschenault, Pinjarra/Peel Inlet and Lancelin. They will be met at Norseman or Perth Airport and directed to the sites.

On 1st January 1985 they all come together at Sorrento — one of Perth's northern beaches, for a five day City Venture.

At both their Ventures there will be a wide variety of activities in which they can participate. One of these is an Electronic Workshop, similar to those which have proven popular in the last few Jamborees.

VK6SAA will operate for most of the time each day at or close to the recognised World Scout frequencies — as used for calling CQ during JOTA. These are 28.590, 21.170, 14.190 in VK (14.290 for DX), 7.090 and 3.590 (VK) MHz.

Scout Headquarters Station VK6SAA will have regular skeds with local amateurs at the country sites to keep in touch with their organisation, leaders and activities.

If an amateur has a particular interest in a Scout Group the organising team would welcome a letter requesting a sked (or more than one) on a time and band best suited to the other end. We expect to have three rigs running so should be able to meet any sked.

73,
Peter Hughes VK6HU,
Assistant Branch Commissioner (Radio Communications),
Scout Association — WA,
58 Preston Street,
Como, WA 6152.

VK4 DISABLED PERSONS RADIO CLUB

The Club would like to thank you for the great, comprehensive coverage you gave us on page 44 of the June issue. The response has been encouraging and general interest has been widespread.

However in regard to 'June's Best Photographs' on page 55 of the July issue we feel it is only fair to advise you that the photo of Tony Burge was taken by a professional photographer working for the Toowoomba Chronicle, our local daily paper, several years ago for use in a feature article covering some of Tony's early achievements in the hobby.

We all agree that the photo says it all. No words are needed. We have permission from the Chronicle to use the photo where we feel it can do the most good. They gave the photo to Tony's family and, I might add, they are very happy with the overall coverage and response.

Hoping this will save any embarrassment and misunderstanding, I remain,

Yours Sincerely,
Graeme Whitehead. VK4 NYE.
Box 3126,
Town Hall,
Toowoomba, Qld. 4350

TRIO

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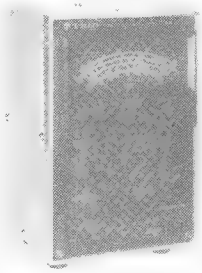

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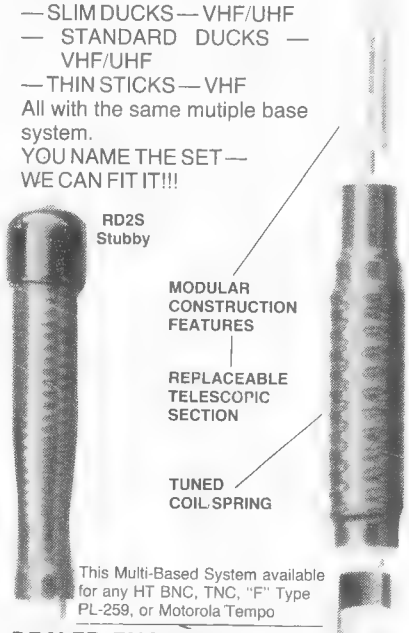

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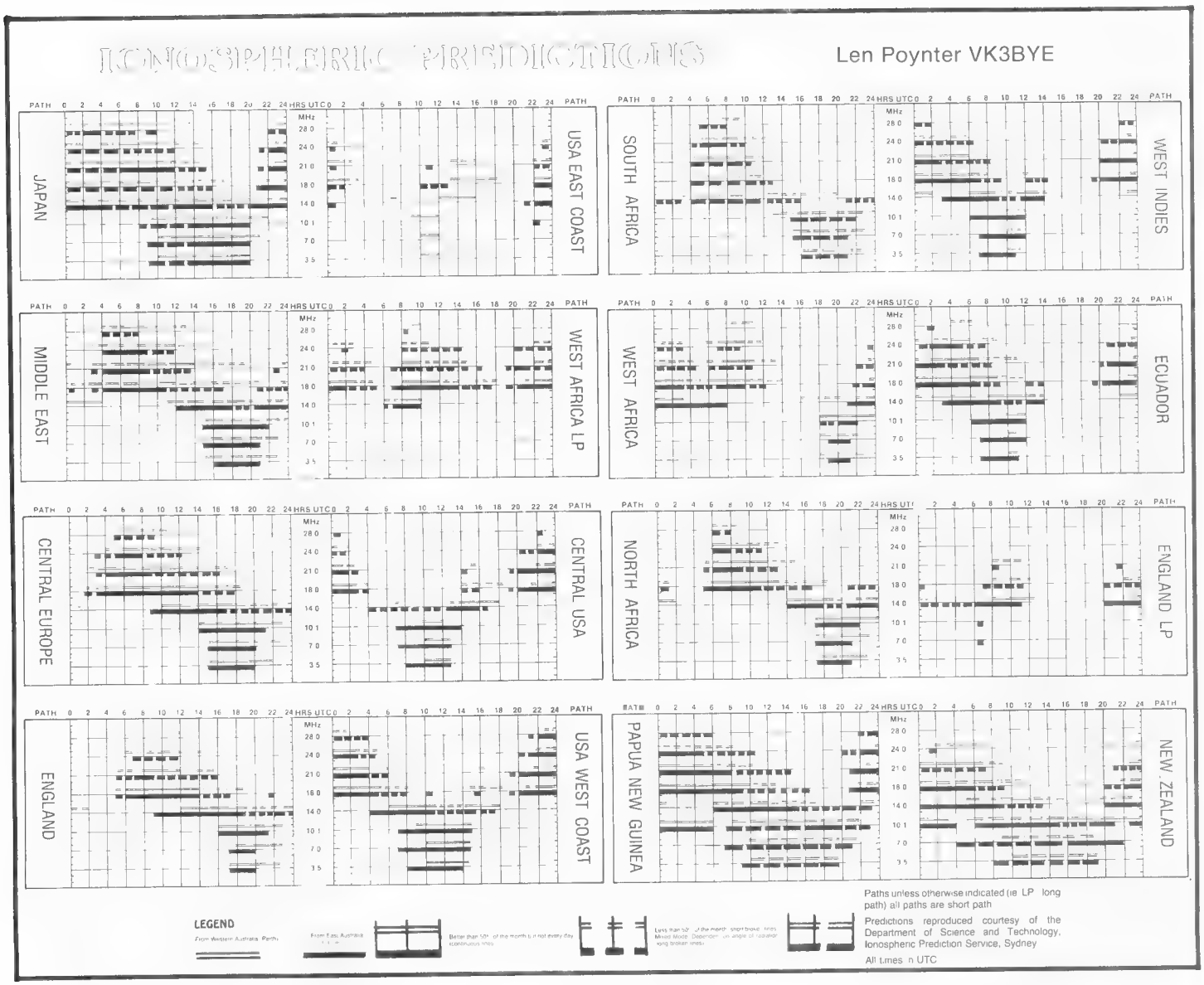
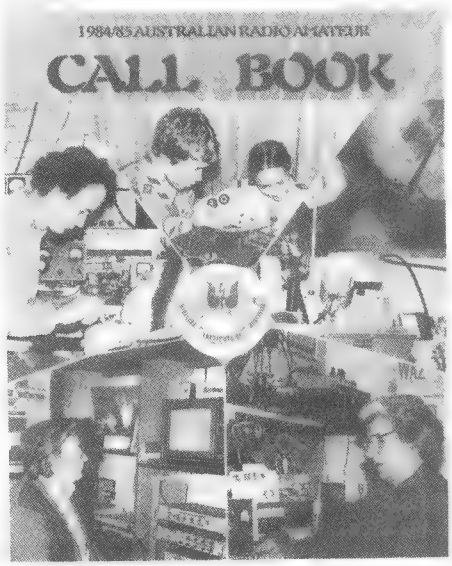


1984-1985 CALL BOOK

The Thirtieth Edition of the Australian Radio Amateur Call Book is now available from Divisional Book Shops, Magpubs (Box 300, Caulfield South, Vic 3162), selected Book Sellers and other outlets throughout Australia.

This issue contains 192 pages of new and updated call sign listings, diverse aspects of amateur radio (packet radio, fast scan TV, QRP operation etc), WIA Band Plans, updated repeaters and beacons and much more.



The Last Steps of JG1QFW

Many amateurs possess a spirit of adventure and a thirst for achieving goals. Most quench it in shacks, trying to make WAS on 144 MHz or DXCC on CW. Others are wedded to the workshop, where they modify, improve and design radio gear. Still others, like Naomi Uemura JG1QFW, take their rigs and adventurous spirit where no other person has gone before.

Denali, the tallest peak on the North American continent, is a veritable giant standing 6200 metres above the sea. In winter, an almost impregnable armor of fierce storms and unfathomable cold seals the peak from all but the most hardy souls, experts in severe mountaineering and survival. One such soul, Naomi Uemura, JG1QFW, recently accomplished something no one else had ever done: scale Denali in winter, *alone*. But it probably cost him his life.

Denali, the Indian name for "Great One," is also known as Mount McKinley. It lies 35° north of the latitude of the great Himalayan Range of Asia, between Anchorage and Fairbanks, Alaska, below the Arctic Circle.

Uemura was well acquainted with danger. In the '60s, he climbed Mont Blanc, the highest peak in Europe; Kilimanjaro, the higest peak on the African continent; and Aconcagua, the highest in South America. He climbed Everest in 1970.

On 1 May, 1978, he became the first person to reach the North Pole — *solo*. During that trek, he relied heavily on amateur radio. A network of emergency amateur stations organized by JG1QFW, the Smithsonian Institution, ARRL and others fortunately did not need to activate.

On 26 January, 1984, Uemura was deposited by a bush pilot at the base of Denali. He departed Base Camp on 1 February with a bare minimum of provisions, including communications gear, hoping to make a quick, alpine-style ascent. It is not known if he carried amateur radio.

On 12 February, his 43rd birthday, JG1QFW stood atop the summit, the first person to solo Denali in winter. The achievement came 14 years after his first-ever solo ascent of the mountain in any season.

He was last seen during his descent. He had had radio contact with planes circling overhead. Pilots reported later that Naomi sounded 'tired" through the weak communications link. Then, he was gone. Despite severe weather problems, a Japanese team of four climbers, including two Everest veterans, searched for days without finding a trace of Uemura.

First licensed as JG1QFW in 1974, Uemura maintained his station in Tokyo. Often called "Animal Uemura" because of his incredible vitality, JG1QFW believed that it is nonsense to do something already done, to follow others. Naomi was a leader. It's not suprising that he was an amateur, is it?

abridged from QST, May 1984

AR

QSP

DELIBERATE INTERFERENCE

In mid April 1983, one American amateur was fined US$2000 and his licence renewal rejected for deliberate interference to Two Metre Repeaters in the San Francisco area. In early July of this year, the Federal Communications Commission (FCC) through an attorney have filed another complaint with the courts to recover the fine and an order to stop further unlicenced operation. This follows numerous attempts by the FCC to collect the fine levied.

The Commission says that this action is unusual in a service that has for years prided itself as being self-regulatory. "However, present problems with two metre repeater operators have given the Commission serious concerns for the future of Amateur Radio requiring firm enforcement action to halt the degenerative trend".

Adapted from ARRL Newsletter

AR

Silent Keys

It is with deep regret we record the passing of —

MR R F LINGHAM	**VK4ARL**
MR F G BASSETT	**L40874**

Obituaries

PETER NEIL ALSTON — VK3NNY

His many friends both in and out of the Amateur Service will mourn the passing of Peter Alston — VK3NNY. Peter, who lived in Eaglemont (Melbourne) had been ill for some time, and died on the 6th July 1984, at the young age of 20 years.

He obtained his Novice Licence in 1978 when he was 14, and he soon made his name on the air as a keen exponent of CW, at which he became very proficient. This is evidenced by the fact that he was one of the top VK Novices in DX contacts, the majority of which were on CW.

Peter joined the Institute in 1980, and amongst other things was interested in the promotion and operation of JOTA.

To his father, mother, and brother VK3KOA, we offer our sincere condolences.

John Ryan VK3AZA

AR

bankcard welcome here

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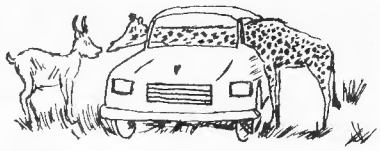

All copy for inclusion in November 1984 Amateur Radio must arrive at Box 300, Caulfield South, 3162 no later than midday 25th September.

HAMADS

PLEASE NOTE: *If you are advertising items FOR SALE and WANTED please write on separate sheets, including ALL details, eg Name, Address, on both. Please write copy for your Hamad as clearly as possible, preferably typed.*

*** Please insert STD code with phone numbers when you advertise.**

- Eight lines free to all WIA members. $9 per 10 words minimum for non-members.
- Copy in typescript please or in block letters double spaced to PO Box 300, Caulfield South 3162.
- Repeats may be charged at full rates.
- QTHR means address is correct as set out in the WIA current Call Book.

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being resold for merchandising purposes.

TRADE HAMADS

Conditions for commercial advertising are as follows: The rate is $15 for four lines, plus $2 per line (or part thereof) minimum charge $15 pre-payable. Copy is required by the deadline as stated below indexes on page 1.

AMIDON FERROMAGNETIC CORES: Large range for all receiver and transmitter applications. For data and price list send 105 x 220 SASE TO: RJ & US IMPORTS, Box 157, Mortdale, NSW 2223. (No enquiries at office: 11 Macken Street, Oakley, 2223).

PACKET RADIO VOLUME 1 by Robert Richardson. Overview of the subject with detailed information on Vancouver Protocol. Fully commented Z80 Assembler programme. Information on Demod and Interface circuits. Programme disks for Tandy Models 1 and 3. Last copies reduced to clear. Price $18 plus $3 P&P. Disks $15. Northern Digital, PO Box 333, Charlestown, NSW. 2290. Ph: (049) 43 8981.

WANTED — NSW

AUSTRALIAN RADIO PUBLICATIONS: Radio Trade Annuals, Radio Review, Radio Retailer, Wireless Weekly, Listener In, etc. University model USO Universal spkr & output meter. AWA radio parts, dial glass for 7 band mod 609T, dial escutcheon for mod 246 (1938). Radio service manuals Vols: 9, 10, 12, 13, & 14. Brian VK2EFD, Box 131, Cooranbong, NSW. 2265. Ph: (049) 77 2178.

SUPERMATCH KW-107 or 109, or Kenwood AT-230 tuner. Reasonable price please. Dennis VK2AOO, QTHR. Ph: (063) 68 2283.

TELETYPE EQUIPMENT in working order. Wanted by beginning RTTY enthusiast. Also information on RTTY. Have working STC 2-way radio to swap if desired. Andrew VK2EPO, QTHR. Ph: (02) 636 9310.

WANTED — VIC

BEAM – TH5, TH6 or TH7 High Gain beam or A4 Cushcraft. Will pay freight & accept reverse charge call. Must be in top condition. Barry VK3XV. Ph: (03) 527 4029.

PROJECT OMEGA . . . I wish to make contact with other builders of this all mode, all brand HF txcvr kit as described in "Ham Radio Today" with a view to discussing any problems or modifications that may arise out of such a project. VK3ALS, QTHR. Ph: (055) 86 7502.

VALVES WANTED FOR RESTORATION of old txcvr. 4 x 1K5G, 2 x 1C7G & 2 x 1K7G. Peter VK3BOD. Ph: (03) 288 2450 AH.

WILL SWAP 2m IC-202 with 4 sets xtals for 6m IC-502. Hepburn. Ph: (03) 596 2414 anytime.

WANTED — QLD

MOBILE RIG – 2m FM. John VK4SZ. Ph: (070) 61 3286, or send price & copy of specs to 10 Tulip Street, Innisfail, QLD. 4860.

WILL PAY GOOD PRICE for Simplex or Pendagraph PMG type semi-auto "bug" Morse keys. VK4SS, 35 Whynot Street, Westend, Brisbane, Qld. 4101.

FOR SALE — NSW

CONTEST LOGKEEPING: Suite of four programmes for RD or other VK/ZL/P29 contest. Written for the Commodore 64. Random access for fastest possible checking of calls. Backup if the power fails. Disk or tape. Final printout on monitor or printer. $55 for suite. Vicki VK2EVM, QTHR. Ph: (063) 68 2137.

CW KEYBOARD, "Aercom CKB-4" in perfect work order. Beautiful appearance, has 64 character buffer memory & speeds of from 8-99 WPM. $298 + freight. Erik VK2BEK, QTHR. Ph: (065) 52 6085 evenings.

DIAWA ROTATOR DR-7500X preset control with mast, clamp & machined brackets to fit power pole or similar. 60m plus of 50ohm coax. 30m of 6 core cable for rotator. $220 ONO. Kel Williams VK2EWK. Ph: (062) 97 7734 between 6-8 pm.

FT-101E. Good cond. 10, 18, 24.5 MHz installed. C/W spare finals, orig packing & h'book. $399. FTV-650B 6m t'verter in good cond. C/W cables & H'book $99. FRG-7 comm rx in good cond. C/W H'book $199. Yaesu external spkr. Suit 101, FRG-7. $20. VK2EVB. Ph: (066) 52 7160 or Box 433, Coffs Harbour, NSW. 2450.

HEATHKIT UNITS. SB-101/102 CW FILTER. New finals. SB-640 ex VFO. SB solid state power supply. Cables & manuals. Ex cond. Air test here available. $295. Heathkit Cantenna 50 ohm. New $30. Hammarlund HQ-145 gen cover rx. .54-30 MHz. Band spread on 20m. Controls slot freq, slot depth, phasing, selectivity, ant tuning, AVC, limiter, RF gain, Aud gain/pwr sw, mode CW, SSB, AM, cal. One of the best rx ever made. Just serviced & product detector installed. Manual. Super rx for amateur or SWL. $150. ATR-2C tcvr. Covers 3.5 & 7 MHz bands in orig steel cab. Mint cond. $100. Harry VK2DA, QTHR. Ph: (02) 94 1039.

ICOM IC-2A 2m FM synth H' held tcvr. As new $200. 144-28MHz Microwave Modules Ltd. MosFET converter, 2.5 dB NF. $30. Bruce VK2AMT, QTHR. Ph: (02) 451 4902.

ICOM IC-22S 2m tcvr. Recently serviced, top cond. All access & manual. $200. VK2AQW. Ph: (02) 635 6572 BH, (02) 969 2160 AH.

KENWOOD TS-120S complete with cable, H'book, packing & mic. $495 ONO. (Now have TS-430 & XYL says can't have both). KDK-2016A 25W 2m tx/rx, four mems & scanning. What offers? Wilson 5el 10m beam handles 1kW, 2 inch boom. $80. (collect only). Les VK2BBD. Ph: (067) 69 6622 BH or write QTHR.

QRO SPLIT-FILTER (highpass, lowpass), harmonic absorber & harm power calibrated for 50uA/metre. Gold plated terminals, silver plated coils, coax, capacitors, DL-made, new $60. Sig gen, TE-20D (JA-made) 120kHz-500MHz, modulator, 8MHz xtal, new $45. Base station DX mic, EX-500, Turner (US-made), amplifier, gain & frequency response control, gain & battery meter. 200-4000Hz. $40, as new. Data sheets for all gear. Ph: (02) 53 9789.

SHACK SELL-OUT – Swan 350, H'book, mic, spare finals, 420 VFO to suit $325. 12V DC/DC P/S, 500W for Swan 350 (or 700) $90. Swan 700-CX, H'book, mic, spare finals, AC P/S, $400. Panda 120V, AM/CW tx, with H'book, some spare valves $100. (Buyer collect). ATR-2B modified for excellent AM 40/80m with 12V DC supply, circuit $50. No 22, complete with DC/DC supply, phones, mic $35. (Buyer collect). VK2BO, QTHR. Ph: (048) 21 2028.

TEN-TEC 580 DELTA with matching ATU fitted with noise blanker & 250 Hz CW filter. $1100 ONO. Also 2 x Yaesu FT-207R 2m H'held. Not very old. Anthony VK2BCZ, QTHR. Ph: (02) 53 6342 AH.

TOWER – 50 feet, 3 section, free standing, needs some work $300. Also 60 feet winchable mast, with all cabling. Needs winch, $250. Moving residence. Both must go. John VK2QY. Ph: (046) 33 8175.

YAESU FRG-7 COMMUNICATIONS RX. VG cond. $220 ONO. Bernard VK2NUU. Ph: (02) 747 1738.

YAESU FT-101E HF tcvr. Good cond. spare finals, with desk mic, $450. Bob VK2VMX, QTHR. Ph: (063) 51 4217.

YAESU FT-107M, WARC, mems, mic, service manual $750. Yaesu FT-208R, 2m H'held $295. All band ATU, 1kW, $75. All in ex cond. VK2XAK, QTHR. Ph: (049) 33 4648.

FOR SALE — VIC

AVO SIGNAL GENERATOR, type AP-71115, 2-225MHz in 7 bands. $100 ONO. Hepburn. Ph: (03) 596 2414 anytime.

AR-240 2m H'held tcvr. Fully synthesised, 140-150 MHz, repeater shifts & tone burst. Complete with helical antenna, case, nicads & charger. Bargain $210 or exchange/part exchange for 70cm tcvr. VK3CVA. Ph: (051) 49 4123.

BELCOM LS-707 UHF all mode tcvr C/W power supply $550. Icom IC-502 6m $140. Icom IC-202 2m with 15W linear & OSCAR $180. All EC. No mods. David VK3YLV. Ph: (053) 82 4000 AH.

FL-200B YAESU tx (Sommerkamp). FR-100B rx (Sommerkamp). Crystal mic, VSWR meter, 80, 40, 20m dipole – $400. 40ch Electrophone UHF unit. $300. Ernie VK3DPP. Ph: 589 5082.

ICOM IC-22A 2m tcvr, ch 2, 3, 4, 5, 6, 7, 8, rep & simplex 40, 50. $150. IC-2A 2m H'held $175, IC-22A 2m mobile $125. Yaesu FV-50 VFO $25. Ten-Tec keyer $30. Pye Overland 6m FM tcvr on 52.525 MHz $60. New 3-500Z valve, base chimney $120. Home-brew 80W valve PA 2m (QQEO6/40) $60. David Norris VK3DWN, Box 231, Mildura, Vic. 3500.

ICOM IC-730 HF tcvr complete with mic & all cables. Perfect cond. $675 ONO. Radio Shack PRO-30 H'held VHF/UHF scanner C/W AC/DC power supplies with aerial & H'book. Only 4 mths old. $425 ONO. Lionel VK3NM not QTHR. Ph: (03) 877 7621 AH or (03) 720 1755 BH.

ICOM IC-751 with in-built power supply. Scanning mic incl. Sell for $1400. (10 mths old.) IC-720 with PS-15 power supply. Mic incl. Sell for $750. (Will consider swapping IC-720 for an FT-902D or similar rig.) Rolf VK3AOF. Ph: (03) 3478 AH.

KENWOOD TS-830S very good cond. $950. Gerhard VK3CGA. Ph: (03) 419 8642.

PYE OVERLAND LOW BAND txcvr. Best offer. VK3DCK, QTHR. Ph: (060) 71 2295.

VINTEN BTR-10 FM BASE STATION with remote handset. Converted to 2m with 40W out. EC $70. ST-KF-430 UHF mobile, very compact, with 3 rep & 2 simplex channels. $120. VK3YAZ, QTHR. Ph: (03) 277 9096.

YAESU FRG-7 rx less than 3 hours use. Inc 5 band antenna & Amateur Radio mags & instr manual. $250. Ph: (051) 44 2100.

YAESU FT-102 tcvr, FC-102 ATU, FP-102 spkr with YM38 desk mic (no split) $1250. Icom IC-102A 2m tcvr incl 240V & 12V chargers & case all cartons & manuals. $325. FT-101 tcvr with mic & manual $375. VK3PJW. Ph: (03) 877 5607.

YAESU FT-102 6 mths old. Used very little $975. Yaesu FL-2100Z linear amp. 12 mths old in very good cond. Like new. $550. Jim VK3NR. Ph: (03) 367 6920.

YAESU FT-707 tcvr in 100% working cond. with instr. book & mic $635. Also Yaesu FP-700 power supply to suit output voltage 13.5 DC. Output current 20A at $175 in orig carton. Kenwood PC-1A Phone Patch controller entirely complete with all access & instr book. Never unpacked. $80. VK3ML QTHR. (03) 20 7780.

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